DOCUMENT RESUME

ED 352 765 EC 301 695

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TITLE Cocaine Babies: Florida's Substance-Exposed Youth.
INSTITUTION 414 Florida Education Center, Tallahassee.
PUB DATE [90]
NOTE 113p.; Parts of the document have marginal and reduced print.
PUB TYPE Information Analyses (070) -- Guides - Non-Classroom Use (055)

EDRS PRICE MF01/PC05 Plus Postage.
DESCRIPTORS Alcohol Abuse; Behavior Problems; *Child Development; *Cocaine; *Congenital Impairments; Drug Abuse; Early Childhood Education; Early Intervention; Family Environment; Incidence; *Intervention; Learning Problems; Resources; School Role; *Substance Abuse
IDENTIFIERS *Fetal Drug Exposure; *Florida

ABSTRACT

This report is designed to provide Florida's school personnel with assistance in working with students prenatally exposed to cocaine or other toxic substances. The report offers background data, practical strategies for teaching and learning, and resources for networking. The first chapter outlines statistics on the incidence of the problem of substance abuse in pregnant women, describes substances commonly used, and discusses symptoms of substance abuse. Chapter 2 examines the effects of prenatal exposure to alcohol and other drugs on the fetus, infants, toddlers, and older children. The next three chapters address the role of the child's environment, the role of the school, and the role of other helping professionals. The final chapter discusses resources available to aid the helping professional, including two hotlines; 17 sources for information, consultation, and training; and a selected bibliography of approximately 25 items. Several journal articles and papers are appended, including "Infants Exposed to Cocaine in Utero: Implications for Developmental Assessment and Intervention" (Jane W. Schneider and others); "Drug Exposed Babies: Research and Clinical Issues" (Donna R. Weston and others); "The Development of Young Children of Substance-Abusing Parents: Insights from Seven Years of Intervention and Research" (Judy Howard and others); "Psychological and Behavioral Effects in Children Prenatally Exposed to Alcohol" (Ann Pytkowicz Streissguth and Robin A. LaDue); "Behavior and Learning Difficulties in Children of Normal Intelligence Born to Alcoholic Mothers" (Sally E. Shaywitz and others); and "Letter from Prison: A Cocaine-Addicted Mother." (JDD)

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COCAINE BABIES:

Florida's Substance-Exposed Youth

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COCAINE BABIES:
Florida's Substance-Exposed Youth

Hot Topics

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Special thanks to the editorial review committee:

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Thanks to those who provided information and other assistance:

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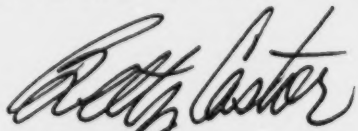
A MESSAGE FROM THE COMMISSIONER OF EDUCATION . . .

Please accept this copy of the most recent **HOT TOPICS** publication, **COCAINE BABIES: FLORIDA'S SUBSTANCE-EXPOSED CHILDREN.** This publication was developed by the Prevention Center in the Department of Education's Office of Policy Research and Improvement (OPRI). The **HOT TOPICS** series is designed to keep educators and policymakers up-to-date on important issues and trends in education. Each publication is developed with the input of education and content experts, and contains the most recent available information and research.

Parents, social service providers and educators must work together to successfully teach and nurture substance-exposed children. The intent of **COCAINE BABIES: FLORIDA'S SUBSTANCE-EXPOSED CHILDREN** is to provide assistance in working with these special students. The challenge of meeting the needs of substance-exposed children is here in hundreds of pre-kindergarten, kindergarten, and elementary school classrooms.

I am aware that teachers, principals, district administrators, school nurses, counselors, and psychologists need assistance in identifying and educating substance-exposed children. **COCAINE BABIES: FLORIDA'S SUBSTANCE-EXPOSED CHILDREN** provides some of that help. Included is a summary of current publications on this critical issue. Also included is a resource list with contacts of organizations around Florida which parents and educators can call on for additional information.

Our intent is to serve you and your staff with usable information on issues of high priority in public education. If we can be of further assistance, please call Nancy Fontaine, Program Director, Drug-Free Schools, or Dan Thomas, Public Information Specialist, Prevention Center, (904) 488-6304.



Betty Castor
Commissioner of Education

EXECUTIVE SUMMARY

In recent years the problem of substance abuse during pregnancy has intensified dramatically due to the widespread use of cocaine and its highly addictive derivative, crack. Pervading all social strata, and including teenagers who are often completely unaware of the possible consequences to an unborn child, drug use among pregnant women is shockingly prevalent. Researchers now estimate that one in ten newborns across the U.S. is a substance-exposed child. (Throughout this document, the terms "substance-exposed child" and "prenatally-exposed child" will be used interchangeably.)

The statistics on the prevalence of drug use during pregnancy have serious implications for our educational systems, because substance-exposed children often are unable to function in a traditional school classroom. The absence of consistent physical and emotional nurturance in their early lives causes these children to have difficulty with even the most basic skills, like processing and following directions, playing with toys, or interacting with others. Further, they are at risk for chronic health problems, social and psychological maladjustment, and school failure. Without intervention, their prospects for a successful future are dim.

Yet there is hope. Substance-exposed children do respond to a classroom environment designed to meet their particular needs. Smaller classes that provide a structured learning environment are essential. With individualized attention from teachers trained to work with special neurological and behavioral problems, prenatally-exposed children are able to grow emotionally, socially, and intellectually. In coordination with other helping professionals working to serve drug-involved families, educators have the opportunity to significantly enhance the lives of substance-exposed children.

Cocaine Babies: Florida's Substance-Exposed Children was created to provide teachers, principals, district administrators, school nurses, counselors, psychologists, and others working with prenatally-exposed children with background data, practical strategies for teaching and learning, and resources for networking. Several themes expressed in this document represent the current thrust of research and practice in the area of substance abuse during pregnancy:

- prenatal substance abuse can cause a wide range of impairments which can either be mitigated or exacerbated by the child's early environment;

- early intervention is very effective in helping substance-exposed children, particularly when the entire family is involved and services provided by professionals of all disciplines are coordinated;

- the fundamental processes of bonding and attachment are particularly vulnerable to the stresses caused by prenatal exposure to alcohol and other drugs, and can inhibit emotional, social, and intellectual development in later years;

- the emotional and intellectual problems resulting from prenatal exposure to alcohol and other drugs are often very subtle, and frequently occur in children of normal intelligence;

- substance-exposed children require a school setting with a great deal of individualized attention, characterized by understanding, patience, structure, and consistency;

- a wide range of resources in a variety of areas, including specific teaching strategies for prenatally-exposed children, are available for educators and other helping professionals.

The full tragedy of Florida's substance-exposed children has yet to unfold. As these children reach adolescence and adulthood, they will be likely candidates for more serious problems unless they and their families receive the help they now need. Schools are faced with the challenge of providing this special assistance. Though additional resources may be required, the benefits to substance-exposed children, their families, and society are invaluable.

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Chapter 1

WHAT IS THE PROBLEM?

- Statistics
- Substances
- Symptoms

Chapter 1
WHAT IS THE PROBLEM?

STATISTICS

No one can say precisely how many babies are affected by prenatal exposure to alcohol and other drugs, but estimates do exist. Other statistics on related problems like child abuse and neglect and juvenile crime are also instructive in two important ways. First, they point to the fact that the problem is multifaceted, much more complex than the tragedy of substance-exposed infants in isolation. Second, such related statistics show a sharp increase since crack cocaine achieved widespread popularity throughout the United States.

How many pregnant women are using alcohol and other drugs?

- Approximately 1 in 10 pregnant women were found to have used drugs while pregnant, according to a 1988 survey of 36 mostly urban, public, and private hospitals across the United States. Reports of usage ranged from 0.4% to 27%, depending on the thoroughness of the assessments. The number of public aid patients was not a factor.[1]

- Fifteen percent of women of childbearing age (15 to 44 years) currently use alcohol and other drugs. Of these, 34 million consume alcohol, 18 million smoke cigarettes, and more than 6 million use illicit drugs.[2]

How large is the problem of cocaine use by pregnant women?

Recent studies in the United States reported:

- Cocaine-addicted babies account for 80% of the substance-affected babies born to women participating in the treatment program at Northwestern Memorial Hospital's Perinatal Center for Chemical Dependence in Chicago.[1]

- Fifty-eight percent of the women seeking obstetrics care at the Family Center of Jefferson Medical College in Philadelphia currently show cocaine in their urine screens; in 1985, the proportion was 7%.[2]

- Of the 1226 women who gave birth at Boston City Hospital between 1986 and 1988, 27% had smoked marijuana and 18% had used cocaine during their pregnancies.[2]

- In a study conducted at Boston City Hospital in 1988, marijuana users gave birth to babies who were three ounces lighter and one-fifth of an inch shorter than babies born to non-marijuana smokers. Cocaine use was associated with even shorter and lighter weight infants.[2]

How many babies are affected?

- A recent national study suggests that as many as 375,000 infants may be affected by substance abuse each year.[1]

- An estimated 50,000 babies a year suffer the effects of maternal alcohol use during pregnancy; 10% suffer irreversible birth defects.[2]

- It is estimated that there are between one and three cases of Fetal Alcohol Syndrome among every 1,000 live births.[3]

What are the statistics for Florida?

- An estimated 5.5% of the 185,000 babies born in 1988 in Florida were substance-exposed newborns.[4]

- In 1988-89, 10,425 newborns born in Florida were exposed to drugs prenatally.

- 70% of the substance-exposed newborns in Florida are estimated to be "cocaine babies" who test positive for cocaine as well as other drugs.[4]

- 13% of the substance-exposed newborns in Florida are estimated to be "cocaine-involved babies" whose mothers have a history of cocaine use, but do not test positive for cocaine at birth.[4]

- 17% of the substance-exposed newborns in Florida are estimated to be "other-substance-exposed newborns," affected by marijuana, alcohol, amphetamines, heroin and/or other drugs, but not cocaine.[4]

- Only 36% of the mothers of Florida's substance-exposed babies reported receiving any prenatal care.[4]

- Low birthweight was a problem for 38% of the exposed babies who did not have prenatal care, and for 26% of those who did have prenatal care. Thus, prenatal care made a difference despite exposure to drugs. [4]

- 3442 cases involving substance-exposed newborns were handled by HRS in fiscal year (FY) 1988-89, as compared with 1930 in FY 1987-88. 4835 cases are estimated for FY 1989-90 and 6219 in FY 1990-91.[4]

Are there any options for substance-abusing pregnant women?

- In a telephone survey of 18 public and private hospitals, two-thirds said that they had no place to refer substance-abusing pregnant women for treatment.[5]

Sources:

[1] National Association for Perinatal Addiction Research and Education (NAPARE)

[2] National Institute on Drug Abuse (NIDA)

[3] Florida Alcohol and Drug Abuse Association (FADAA)

[4] Florida Department of Health and Rehabilitative Services (HRS)

[5] U.S. House of Representatives National Select Committee on Children, Youth and Families

SUBSTANCES

Among substance-abusing pregnant women, polydrug use tends to be the rule. Substances like alcohol and nicotine, for example, are often used in conjunction with a primary "drug of choice," such as crack cocaine. This makes it difficult to identify the particular effects on the fetus of specific drugs in isolation from one another. No substance, however, may be used by a pregnant woman without risk to the developing baby.

What are the most commonly used substances?

ALCOHOL is the most widely used and abused drug in the U.S.. Ethanol is the active ingredient, which acts as a central nervous system depressant to slow down bodily functions like heart rate, pulse, and respiration. Alcohol affects different people in different ways, depending on the amount consumed, body weight, gender, the presence of food in the body, and the expectations one holds. In small quantities, alcohol may bring on feelings of well-being and relaxation; in larger amounts it can cause intoxication, sedation, unconciousness, and even death.

COCAINE is a short-acting, powerful central nervous system stimulant that is extracted from the South American coca bush. The cocaine (cocaine hydrochloride) available in this country is a pure white crystalline powder combined with adulterants added to stretch the supply and increase the seller's profit. Talc, flour, laxatives, sugar, and local anesthetics are just a few of the additives used to cut cocaine. Cocaine is snorted through the nose, injected into a muscle or vein, or converted into a smokable form called freebase.

CRACK is a nearly pure form of cocaine that comes in the form of a light brown or milky white pellet or "rock." Because it is smoked, crack delivers a burst of cocaine to the brain in less than 15 seconds, causing a dramatic high. Persons who smoke crack report feeling extremely powerful and sexually aroused. Yet within minutes the user is left craving more, as the euphoria is replaced by severe depression, paranoia, and irritability. In this way, crack users rapidly enter into a continuous cycle that can leave them physically and psychologically addicted in as little as two weeks.

MARIJUANA is a crude drug made from the plant Cannabis Sativa. THC (delta-9-tetrahydrocannabinol) is the main mind-altering ingredient, though burning or smoking marijuana allows as many as 2,000 secondary chemicals to enter the body. A marijuana cigarette or "joint" is made from the dried particles of the plant. The strength of marijuana's effect depends on the amount of THC it contains.

PCP is phencyclidine, a synthetic drug first developed as an anesthetic agent for surgery in the 1950's. Today there is no legal use for PCP. PCP is notorious for its variety of effects and for its unpredictability, acting at different times as a stimulant, depressant, or hallucinogen. PCP comes in several different forms in its original form as a white or yellowish-white powder, as a tablet, or as a capsule. Different methods of use induce different effects. The most popular is smoking marijuana, parsley, or tobacco sprinkled with PCP powder. PCP can also be snorted, injected, or taken orally by capsule or tablet.

LSD, or lysergic acid diethylamide, is a derivative of ergot, a fungus that grows on rye and other grains. Early on it was used to treat mental disorders, alcoholism, epilepsy, and terminal cancer. Despite its later illicit status, it became popular when interest in its alleged mystical effects grew. LSD is a potent hallucinogen or psychedelic drug, even when taken in extremely small amounts. One ounce is able to supply about 300,000 doses. LSD is odorless, colorless, and tasteless. In its liquid form it is placed in or on another substance - sugar cubes, postage stamps, "microdots" (tiny balls of compacted powder), "windowpane" (small squares of gelatin sheets or cellophane), and "blotter" (small squares of paper) and licked off or swallowed.

OPIATES are central nervous system depressants which are often used medically to relieve pain. Opiates are classified as narcotics, and include such drugs as heroin, codeine, opium, and morphine. They are derived from a resin taken from poppy plants found in countries throughout the world. Some opiates, like Demerol, Darvon, Percodan, Dilaudid, and Methadone, are synthesized by modifying the chemicals found in opium. All have a high potential for abuse. They are found in a variety of forms, including powders, liquids, tablets, syrups, and capsules.

SYMPTOMS

Professionals who work with pregnant women using alcohol and other drugs typically fail to recognize and confront substance use in their clients. A national hospital incidence survey conducted by NAPARE, for example, found that substance abuse in pregnancy is one of the most commonly missed of all obstetric and neonatal diagnoses. According to NAPARE president Dr. Ira Chasnoff, "Many of these cases are unrecognized until after birth when the baby is born addicted, often with severe physical or neurological damage." This lack of recognition, Chasnoff asserts, accounts for the high rate of infant morbidity and mortality in these infants.

What might indicate the use of these substances?

DRUG	PHYSICAL SYMPTOMS	LOOK FOR . . .
COCAINE (coke, rock, crack, base)	brief intense euphoria, elevated blood pressure and heart rate, restlessness, excitement, feeling of well-being followed by depression	insensitivity to pain, nausea, vomiting, watery eyes, runny nose , needle marks on arms, needles, syringes, spoons, pinpoint pupils, cold moist skin, weight loss
ALCOHOL (beer, wine, liquor)	intoxication, slurred speech, unsteady walk, relaxed inhibitions, impaired coordination, slowed reflexes	smell of alcohol on clothes or breath, intoxicated behavior, hangover, glazed eyes
MARIJUANA (pot, dope, grass, weed, herb, hash, joint)	altered perceptions, red eyes, dry mouth, reduced concentration and coordination, euphoria, laughing, hunger	rolling papers, pipes, dried plant material, odor of burnt hemp rope, roach clips, increased eating behavior
HALLUCINOGENS (acid, LSD, PCP, MDMA, Ecstasy, psilocybin, mushrooms, peyote)	altered mood and perceptions, focus on detail, anxiety, panic, nausea, synaesthesia (simultaneous perception, for example smelling colors, seeing sounds)	capsules, tablets, "microdots", blotter squares
NARCOTICS (heroin, junk, dope, Black Tar, China White, Demerol, dilaudid, D's, morphine, codeine)	euphoria, drowsiness, insensitivity to pain, nausea, vomiting, watery eyes, runny nose	needle marks on arms, needles, syringes, spoons, pinpoint pupils, cold moist skin

PRENATAL DRUG USE IN PINELLAS COUNTY

WHAT: A recent study was conducted by the National Association for Perinatal Addiction Research and Education (NAPARE), in conjunction with Operation PAR, a St. Petersburg, Florida drug treatment program.

WHY: The purpose of the study was to look at the prevalence of drug use during pregnancy in a sample of pregnant women in Pinellas County, Florida, as well as aspects of the reporting of such cases. Florida has a policy that requires hospitals to notify local health departments when an infant is born with drugs in its system or the mother is an addict.

WHO: 715 pregnant women from both public and private health care sectors were involved.

HOW: From January 1, 1989 until June 30, 1989, a urine sample for toxicology was collected from every woman at her first prenatal visit as she entered care at any of the 5 public health clinics or in 12 of 20 private obstetric offices in the county. Urine samples were tested for cocaine, marijuana, opiates and alcohol.

FINDINGS:

- **14.8% of all women tested positive for cocaine, marijuana, opiates and/ or alcohol.**
- **There were no significant differences in the rates of public or private patients. 13.1% of women receiving private care, and 16.3% of women receiving care in a public clinic, tested positive for alcohol and other drugs.**
- **Though white women (15.4%) had a slightly higher rate than black women (14.1%), differences in the rates of those testing positive for alcohol and other drugswere not significant.**
- **Marijuana was the drug used most often in the overall group.**
- **Cocaine was used by 7.5% of black women and 1.8% of white women.**
- **Because alcohol is metabolized and excreted eight hours after consumption, it is likely that the use of alcohol was more frequent than the urine tests could determine.**
- **Although white women were 1.09 times as likely as black women to have used drugs or alcohol, black women were 9.58 times as likely to be reported to county health authorities for substance abuse during pregnancy.**

ADDICTED INFANTS AND THEIR MOTHERS

The National Select Committee on Children, Youth and Families led by Congressman George Miller talked with hospitals in large metropolitan areas about damage caused by substance abuse during pregnancy. The results of their survey were released at hearings on April 27, 1989.

FINDINGS:

- **Fifteen of the 18 hospitals surveyed reported three to four times as many drug-exposed births since 1985.**
- **Drug-exposed babies are more likely to be born prematurely and have low birthweight, dramatically raising their risk of infant mortality and childhood disability.**
- **Women who seek help during pregnancy cannot get it. Two-thirds of the hospitals reported that they had no place to refer substance-abusing pregnant women for treatment.**
- **Hospitals in Los Angeles and Washington, D.C. reported the re-emergence of maternal death during labor and delivery directly attributable to drug abuse during pregnancy.**
- **Eight hospitals reported growing numbers of "boarder babies" who remain in hospitals because their parents abandon or cannot care for them.**

Rep. George Miller of California writes:

"While the number of drug-exposed babies remains relatively small, they are among the most expensive babies we care for. And, these children have the ability to swamp every system involved with their care - hospitals, child protective services, foster care, and schools.

Hospitals we surveyed cautioned that their estimates vastly undercount the number of women and children affected. They indicated, as well, that these newborns stay in the hospital up to 13 days longer than healthy infants, at a cost which can reach nearly $1,800 a day.

These problems are no longer confined to inner cities. In my suburban district in California, 40 babies a month are born drug-exposed, and these children now represent 60-75% of foster care caseloads in the country."

Chapter 2

WHAT ARE THE EFFECTS OF PRENATAL EXPOSURE TO ALCOHOL AND OTHER DRUGS?

- Categories of Effects
- Effects on the Fetus and Infant
- Effects on Toddlers and Older Children

Chapter 2
WHAT ARE THE EFFECTS OF PRENATAL EXPOSURE TO ALCOHOL AND OTHER DRUGS ?

The effects of prenatal exposure to alcohol and other drugs vary according to the particular circumstances of each child's pre- and postnatal experiences. The frequency, quantity and timing of use, for example, all influence the extent of damage to the fetus. Poor maternal nutrition and inadequate health care can compound the harmful influence of the toxic substances used by the mother during pregnancy. Further, prenatally-exposed babies may fail to thrive after birth as a result of poor feeding habits, inadequate care or disturbed bonding and attachment between mother (or caregiver) and child. In spite of these problems, however, if parents, teachers and other helping professionals meet the substance-exposed child's special needs as early as possible, the long-term consequences of prenatal exposure to alcohol and other drugs can be significantly reduced.

CATEGORIES OF DRUG AND ALCOHOL EFFECTS

Not all babies exposed to drugs and alcohol in the womb are born "hooked." Some babies are born "clean," but may have sustained injury as a result of exposure to some level of alcohol and/or other drugs. Others look perfectly normal at birth, but gradually display symptoms that hint of previous exposure. This variety of possible effects makes identification and intervention even more challenging.

The three categories of effects suffered by infants affected by prenatal exposure to alcohol and other drugs are:

1) ADDICTION - The newborn undergoes withdrawal, after which it may grow and develop more or less normally, as if addiction had not been part of his or her short life experience.

2) TOXICITY - Toxic effects cause direct injury to the developing fetus.

3) TERATOGENICITY - More complex than addiction or toxicity, teratogenic effects may or may not appear at birth. Teratogenic effects involve structural damage of some sort. Drugs that act on metabolic, endocrine, or central nervous system functions may not cause symptoms to emerge until childhood or adolescence.

> ***"... if parents, teachers and other helping professionals meet the substance-exposed child's special needs as early as possible, the long-term consequences of prenatal exposure to alcohol and other drugs can be significantly reduced."***

THE EFFECTS OF ALCOHOL AND OTHER DRUGS ON THE FETUS AND NEWBORN

Some people believe that the fetus is protected from dangerous substances by the mother's placenta. Actually, the opposite is true. Alcohol and other drugs flow rapidly and easily from the mother's bloodstream through the placenta to the baby. Because the fetal liver is not fully developed, such substances also remain in the fetus for a much longer time than in the mother. Cocaine, for example, has been found in six day-old infants who were exposed to the drug two to three days before birth.

COCAINE

How does COCAINE affect the developing fetus?

When a pregnant woman uses cocaine, the risks to mother and child immediately increase. Cocaine decreases blood flow to the fetus, cutting off the passage of growth-enabling nutrients and oxygen. In addition, studies have found that women who use cocaine during pregnancy are more likely to smoke cigarettes and have poor weight gain-factors that also inhibit the development of the fetus.

In the early months of pregnancy, the use of cocaine can cause a spontaneous abortion. Used later, cocaine may result in premature labor, a fetal stroke causing irreversible brain damage, or a stillbirth delivery. In some cases, neurological and respiratory problems may result, or organs may be underdeveloped or malformed. Sometimes the placenta pulls away from the wall of the uterus before labor begins, causing extensive bleeding. This condition, known as "abruptio placentae," can be fatal to both mother and child.

How does COCAINE affect the infant?

Babies exposed to cocaine in utero may remain irritable for six to eight weeks after birth and may not respond well to their environments for two to three months. Other signs of exposure to cocaine include: tremors, usually stiff muscles, irregular sleeping patterns, poor feeding patterns, increased respiratory and heart rates, and difficulty sucking and swallowing. Persistence of symptoms beyond the first few weeks of life suggests to some authorities a more lasting central nervous system change rather than a withdrawal pattern. In addition, some researchers have found that substance exposed infants have a rate of Sudden Infant Death Syndrome (SIDS) ten times greater than non-substance exposed infants.

Neurobehavioral evaluations at 3 days have revealed that prenatally-exposed infants are largely unable to respond to the human voice and face, deficient in the ability to interact with others, and highly unstable emotionally. Very sensitive to even the mildest environmental stimulation, newborns affected by cocaine cry a lot. They do not fall asleep readily and once asleep are easily awakened. According to Dr. Diana Kronstadt of the Far West Laboratory for Educational Research and Development, "The distress of these newborns is obvious and yet they are unable to calm themselves."

A normal infant can shut out unwanted stimulation and take in positive stimulation. Newborns affected by cocaine cannot. Withdrawn and difficult to comfort, they are unable to respond to their mothers in the ways necessary to develop normal mother-child attachment. The infant's unresponsiveness, along with the guilt the mother may feel for using drugs, makes bonding even more difficult. As the mother's feelings of frustration and inadequacy build, the infant becomes increasingly vulnerable to child abuse and neglect.

COCAINE AND INFANT COMMUNICATION

Soon after birth, normal babies enter the give-and-take of human communication. Normally, the biologically-programmed response of an infant to his or her primary caregiver cements the relationship between them. This is the process of bonding.

Newborns affected by cocaine, however, are physiologically unable to respond to their caregivers in the way nature intended. Compared with non-exposed infants, cocaine affected infants have "depressed interactive abilities." They are easily disturbed, difficult to comfort, and unable to provide positive feedback to the caregiver.

As a result, the relationship can be very unsatisfying for caregivers particularly for parents who continue to use drugs. A negative cycle may develop in which the caregiver is unable or unwilling to provide the help required for recovery to an infant exhibiting difficult behaviors. Feelings of inadequacy and frustration on the part of parents may, in turn, lead to further abuse and neglect of the child.

Source: Schneider, J.W., Griffith, D. and Chasnoff, I. (1989, July). Infants exposed to cocaine in utero: Implications for developmental assessment and intervention. Infants and Young Children, 25-36.

ALCOHOL

How does ALCOHOL affect the developing fetus?

Frequent or heavy drinking throughout pregnancy may result in various serious birth defects. The most severe constellation of effects is known as the Fetal Alcohol Syndrome (FAS). Children with FAS demonstrate three kinds of impairments: 1) Growth retardation before and/or after birth, 2) A particular pattern of abnormal features of the face and head, and 3) Evidence of a central nervous system abnormality (brain damage) often resulting in intellectual impairment. FAS is the third most common cause of mental retardation.

Some babies are affected prenatally by alcohol, but lack the full set of characteristics of FAS. Research indicates that there are approximately twice as many of these "mildly affected" children as there are "severely affected" children with FAS. Fetal Alcohol Effects (FAE) is the term used to describe the variety of potential impairments associated with lower levels of maternal alcohol use during pregnancy than that found in mothers of children with FAS. FAE include any of the following: ear and eye defects, heart defects, physical deformities, joint and limb malformations, hemangiomas (a kind of birthmark), cerebral palsy, mental retardation, and neurological abnormalities.

How does ALCOHOL affect the infant?

Prenatal exposure to alcohol may result in subtle central nervous system (CNS) deficits that may cause behavioral and learning abnormalities. Carefully controlled studies have identified a number of these functional Fetal Alcohol Effects: hyperactivity, decreased learning ability, poor locomotion, lack of coordination, developmental delays, sucking and feeding difficulties and response inhibition.

Infants with FAE may also show signs of brain involvement in impaired motor development, decreased capacity to self-regulate physiological states, and sleep problems. Irritable and restless sleepers, infants of heavy drinkers may have difficulties with bonding and provoke abuse from parents. Further, at eight months of age, infants of heavy drinkers showed significant decrements in height, weight, and head circumference.

How do OTHER DRUGS affect the developing fetus and infant?

MARIJUANA

Marijuana can cause premature delivery and even withdrawal symptoms. Like babies born to cigarette-smoking pregnant women, newborns who have been exposed to marijuana in utero may be significantly lower in birthweight and shorter in length. As babies, they may be irritable and tremulous, and deficient in visual functioning. They are also at increased risk for Sudden Infant Death Syndrome (SIDS).

HEROIN AND OTHER NARCOTICS

A mother using heroin and other narcotics is at greater risk for hepatitis (both acute and chronic), endocarditis, and AIDS, if the substance is used intravenously. The chance that the baby will be lost due to miscarriage or stillbirth is also increased. The infant is likely to have low birthweight and small head size (a sign of diminished brain growth). Other problems include withdrawal symptoms, difficulty in responding to human voice and touch, and increased risk of Sudden Infant Death Syndrome (SIDS).

TRANQUILIZERS

Babies of mothers who use tranquilizers often go through withdrawal after birth, suffering such symptoms as reduced ability to nurse, hypothermia, and breathing abnormalities. In addition, some tranquilizers are suspected of causing congenital abnormalities.

BARBITURATES

Sudden withdrawal from barbiturates by the mother or baby may result in seizures or even death. The withdrawal symptoms resemble those of heroine-addicted babies, but tend to be more prolonged and severe.

THE EFFECTS OF ALCOHOL AND OTHER DRUGS ON TODDLERS AND OLDER CHILDREN

The long-term consequences of prenatal exposure to alcohol and other drugs vary considerably, reflecting differences in the child's rearing environment as well as those present at birth. Some children with severe symptoms are unable to function in an average classroom. Many others, typically with normal intelligence, demonstrate subtle impairments not easily associated with prenatal exposure to alcohol and other drugs. Researchers are just beginning to investigate the less obvious deficits of these children. All agree that early identification and intervention can significantly help to remediate learning and behavioral problems.

Highlights of Major Research Studies

INTELLECT, PLAY, AND ATTACHMENT IN POLYDRUG-EXPOSED CHILDREN AT 18 MONTHS

Dr. Judy Howard and associates compared 18 prenatally drug-exposed 18-month-old toddlers with a comparable, non-exposed group. The researchers looked at intellectual functioning, quality of play, and security of attachment to the parent or parent figure.

FINDINGS:

- **Drug-exposed toddlers had significantly lower scores on developmental tests, but fell within the low-average range.**
- **In an unstructured, free play situation requiring self-organization, self-initiation, and follow-through without the assistance of an examiner, the drug-exposed toddlers showed striking deficits.**
- **For the majority of drug-exposed toddlers, play consisted of scattering, batting and picking up and putting down toys rather than the representational play (sustained combining of toys, fantasy play, or curious exploration) more common in the comparison group.**
- **Because representational play is associated with language acquisition, problems in language development are anticipated for drug-exposed children.**
- **The drug-exposed toddlers had more impulsive, less goal-directed behavior than the comparison group.**
- **The drug-exposed toddlers were less securely attached to their caregivers than the comparison group.**

- **The rearing environment, through fostering secure attachment, lessened the impact of prenatal drug exposure, but did not eliminate its effects entirely.**

Source: Howard, J., Beckwith, L., Rodning, C., and Kropenske, V. (1989, June). The development of young children of substance-abusing parents: Insights from seven years of intervention and research, Zero to Three, p. 8 - 12. (See Appendix A)

DEVELOPMENTAL ABILITIES OF COCAINE/POLYDRUG-EXPOSED CHILDREN AT TWO YEARS

At the Perinatal Center for Chemical Dependence at Northwestern Memorial Hospital, the developmental progress of 263 prenatally drug-exposed children was evaluated over two years and compared with a control group of children whose mothers had not used drugs during pregnancy. The mothers of the children were categorized as cocaine/polydrug users because most used cocaine plus other drugs such as marijuana and alcohol.

FINDINGS:

- **Evaluation at birth revealed the infants of the cocaine/polydrug using mothers were more likely to be born prematurely and generally weighed less, were shorter, and had smaller head circumference.**

- **By 3 months of age the mean infant weight had caught up with that of the drug-free control group.**

- **By 12 months of age the two groups were not significantly different in length.**

- **Through 2 years of age, the head circumference measurement remained smaller in the drug-affected children. Smaller head circumference is thought to be a marker of risk for long term developmental difficulties.**

- **This study and others indicate that drug-exposed two-year-olds score poorest on developmental tests that measure abilities to concentrate, interact with others in groups, and cope with an unstructured environment.**

- **The drug-exposed children scored within the normal range for cognitive development and are not, as some people have stated, brain damaged. They will require a structured learning environment and patient, one-on-one attention from teachers and caregivers in order to achieve their maximum learning potential.**

Source: National Association for Perinatal Addiction Research and Education, 11 E. Hubbard Street, Chicago, Illinois, 60611, (312) 329-2512.

LEARNING DISABILITIES IN CHILDREN OF NORMAL INTELLIGENCE EXPOSED PRENATALLY TO ALCOHOL

Children referred to the Learning Disorders Unit of the Yale-New Haven Hospital were evaluated for indications of prenatal exposure to alcohol. The researchers tested the hypothesis that, even in children of normal intelligence without Fetal Alcohol Syndrome, alcohol may be a frequently overlooked cause of behavioral and learning difficulties.

FINDINGS:

- **Of 87 children referred for learning problems, 15 were found to have been exposed prenatally to large amounts of alcohol. All were of normal intelligence.**
- **None of the children displayed the severe symptoms of Fetal Alcohol Syndrome, but all showed the deficits in growth, facial anomalies and "soft" neurological irregularities that would suggest prenatal exposure to alcohol.**
- **Although the children prenatally exposed to alcohol had normal intelligence, subtle central nervous system impairments resulting from exposure to alcohol caused behavioral and learning deficits.**
- **Children born to alcoholic mothers should be followed carefully through the early school years for the possibility of learning difficulties.**
- **Children experiencing school failure should be evaluated for indications of prenatal exposure to alcohol.**

Source: Shaywitz, S., Cohen, D. and Shaywitz, B. (1980, June). Behavior and learning difficulties in children of normal intelligence born to alcoholic mothers. The Journal of Pediatrics, 96, 978-982. (See Appendix A)

POSSIBLE EFFECTS OF PRENATAL EXPOSURE TO COCAINE:

In the fetus:

Miscarriage
Premature labor
"Abruptio placentae"
Cerebral stroke
Stillbirth delivery

In the infant:

Low birthweight
Small head circumference
Impaired motor development
Seizures and strokes
Abnormally formed internal organs
Rapid respiratory and heart rate
Irritability
Frequent startles
Hypertonicity
Unresponsiveness
Tremulousness
Difficulty in being comforted
Irregular sleeping patterns
Poor feeding patterns
Abnormal sucking and swallowing
Disorientation
Frequent gaze aversion
Atypical motor development
Poor interactive capacities
Alterations in bonding and attachment
Increased risk of child abuse and neglect
Increased risk of Sudden Infant Death Syndrome (SIDS)
Increased risk of AIDS and syphilis (from mother)

In the child:

Impaired play skills
Small head circumference
Impaired ability to concentrate
Impaired social skills
Difficulty coping with an unstructured environment
Impulsivity and hyperactivity
Heightened response to internal and external stimuli
Tremors
Irritability
Speech and language delays
Poor task organization and processing difficulties
Problems related to separation and attachment
Motor development delays

POSSIBLE EFFECTS OF PRENATAL EXPOSURE TO ALCOHOL:

In the fetus:

Miscarriage
Premature labor
Stillbirth delivery

In the infant:

Low birthweight

Fetal Alcohol Syndrome, including:

1) growth retardation before and/or after birth
2) a particular pattern of abnormal features of the eyes, face and head, including small head circumference (suggesting diminished brain growth), small eyes, and evidence of a retarded formation of the midfacial area including a flattened bridge and short length of nose and flattened vertical groove between the mouth and nose
3) evidence of central nervous system abnormality

Fetal Alcohol Effects, like:

Physical deformities
Heart defects
Ear and eye defects
Joint and limb malformations
Mental retardation
Cerebral palsy
Neurological abnormalities
Hemangiomas
Irritability
Sleep problems
Impaired motor development; poor locomotion
State regulation disorders
Increased risk of child abuse
Sucking and feeding difficulties
Response inhibition

In the child:

Hyperactivity
Reduced body weight, height and head circumference
Facial abnormalities
Mild hearing loss
Development delays
Attention deficit disorder syndrome, expressed as restlessness, short attention span, distractibility, longer reaction time
Learning difficulties

LOW BIRTHWEIGHT: WHAT DOES IT MEAN?

One of the most common consequences of prenatal exposure to alcohol and other drugs is low birthweight. What does low birthweight actually mean? What significance does it have for a child's development?

A baby is considered to have low birthweight if he or she weighs less than 5.5 pounds at birth. Having failed to thrive in the mother's womb, the low birthweight baby faces significant risks which should not be underestimated. For example, compared with infants of normal weight, low birthweight babies:

- are 40 times more likely to die in the first year of life.
- account for two-thirds of all neonatal deaths.
- are still five times more likely to die even if they survive the first month of life.

In addition, the educational outlook for low birthweight babies is compromised. Low birthweight infants:

- often have neurodevelopmental handicaps, including cerebral palsy and seizure disorders, which are linked with learning disabilities and behavioral problems in the classroom.
- are also susceptible to chronic respiratory problems that can interfere with school attendance.

Finally, these and other potential impairments put families of low birthweight babies in an emotional and financial crisis.

Source: Preventing Low Birthweight. (1985). Institute of Medicine.

DRUGS AND BREASTFEEDING

In the same way they pass freely through the placenta to the developing fetus, alcohol and other drugs pass readily into the breastfeeding mother's milk. Dr. Ira Chasnoff of Northwestern University Medical School reports on the case of a mother who breastfed her infant while snorting cocaine over a 4-hour period. The infant was brought to the emergency room with signs of cocaine intoxication: dilated pupils, hypertension, tachycardia, and extreme irritability.

Source: Chasnoff, I. (1987, May). Perinatal effects of cocaine. Contemporary OB/GYN, p. 163-179.

WITHDRAWAL: The Neonatal Abstinence Syndrome

Sixty to ninety percent of infants born to mothers with a recent history of narcotic abuse show clinical signs of withdrawal. The characteristic sequence of withdrawal effects is called the neonatal abstinence syndrome (NAS). Newborns with NAS show increased sensitivity to noise, irritability, poor coordination, excessive sneezing and yawning, and uncoordinated sucking and swallowing reflexes. Abstinence symptoms last for four to six months after birth, often with a peak in symptoms at about six weeks of age. NAS has also been seen in newborns exposed prenatally to drugs other than narcotics, including phenobarbitol, diazepam, marijuana, cocaine, and alcohol.

Source: Chasnoff, I. (1988, March). Newborn infants with drug withdrawal symptoms. Pediatrics in Review, 9, 273-277.

Chapter 3

WHAT IS THE ROLE OF THE CHILD'S ENVIRONMENT?

- **Profile of the Pregnant Substance Abuser**
- **The Child's Place in the Drug-Abusing Family**
- **Substance Abuse, Bonding and Attachment**

Chapter 3
WHAT IS THE ROLE OF THE CHILD'S ENVIRONMENT?

Environment plays a critical role in the life of the substance-exposed child, since it can lessen or exacerbate the damage that took place in the womb. The child who is moved from one foster care placement to another or who is neglected or abused at home, for example, is unlikely to thrive emotionally, intellectually, socially, or physically . A setting characterized by structure, consistency, and love, on the other hand, can go a long way towards ameliorating the difficulties faced by children prenatally exposed to drugs.

Though substance abuse in pregnancy is found in rural, suburban, and urban settings, among women of all races and economic strata, most studies of substance-abusing pregnant women have involved low socioeconomic status women seeking public aid. These women are alike in several ways. First, they themselves tend to be victims of unresponsive or traumatic rearing environments, without positive role models for parenting. Second, they have great difficulty in meeting the special needs of their drug-exposed children, at least without help. Finally, even when motivated to seek treatment, these substance-abusing pregnant women have few options, since drug treatment programs traditionally exclude pregnant women.

Professionals who face the painful reality of substance-exposed children must avoid demeaning appraisals of drug-involved mothers. The most effective effort is one grounded in empathy for the entire family of a substance-exposed child. According to Dr. Judy Howard at the University of California at Los Angeles (UCLA), the work of she and her colleagues is successful, in part, because of the "stance of respect" from which all staff approach the substance-abusing families engaged in her research and service project. Essential to the cultivation of this respect is a deep understanding of the struggles of substance-abusing families.

PROFILE OF THE PREGNANT COCAINE ABUSER

The following characteristics are drawn from studies of highly impoverished, substance-abusing pregnant women:

- Most have a history of physical, sexual, or emotional abuse.
- They have the disease of chemical dependency and need treatment.
- Their mothers and fathers probably abused alcohol and other drugs.
- They are likely to live with a drug-using partner.
- They may come from the poorest, most deprived, most chaotic environments.
- They feel guilty and responsible for their plight.
- Their orientation to life is often characterized by low self-esteem and powerlessness.
- Denial is part of their disease process. They tell themselves "a little won't hurt," or "I'll do it just once more".
- Blaming, reprisals, and attempts to criminalize them keep them from using systems and services that could help.
- Their ability to be a good parent is compromised by their disease of chemical dependency and the often difficult behavioral characteristics of their infants.

Source: Kronstadt, D. (1989, March). Pregnancy and cocaine addiction: An overview of impact and treatment. Far West Laboratory for Educational Research and Development,Sausalito, CA.

THE CHILD'S PLACE IN THE SUBSTANCE-ABUSING FAMILY

The following is excerpted from "The development of young children of substance-abusing parents: Insights from seven years of intervention and research", an article on substance-abusing families involved in a research/treatment project at the University of California at Los Angeles (UCLA), under the direction of Dr. Judy Howard:

> Substance-abusing parents are unstable, move frequently, lack telephones, fail to keep appointments, and drop out of sight when abusing illicit drugs. Friends and often family collude with the substance-abusing person's flight from representatives of authority structures such as universities, medical and legal systems. We have found, therefore, that it is very important not only to provide clinical services but to provide them through an intervenor who is able to establish an ongoing, stable, nurturing, and non-threatening relationship with the subject.
>
> Substance abuse undermines normal patterns of interaction and alters conventional priorities (Howard, in press). The families we have worked with, who are poor and are chronic polysubstance abusers, have multiple legal, social and medical problems. They often come from a history of impoverishment, abuse, and intergenerational chemical dependence. One mother, for example, told us how her mother taught her to shoplift and then to sell the stolen goods on the street. This mother was introduced to heroin by her own father. (In fact, a significant number of parents experienced their first exposure to drugs and alcohol through their own parents' encouragement.) Another mother told us that when she was upset as a child her mother would mix her a drink and say, "Drink this; it will make you feel better." A third mother stated that her own father "shot me up with heroin when I threatened to call the cops on him."
>
> Parents who are addicted to drugs have a primary commitment to chemicals, not to their children. Disruption and chaos in the household often result in the neglect or disregard of the child's needs. For example, a three-month-old baby in one of our research projects was found underneath a bed by a neighbor. The baby's parents and friends were high and consequently not merely inattentive to the baby's needs but completely unaware of the baby's presence. Another mother explained her inability to keep medical appointments for her child because she was out "chasing the bag" - that is, looking for drugs. Yet another mother explained her pregnancy by stating that "I need this baby to slow me down, to keep me off the streets."
>
> Chronic drug use can impair and distort a parent's thoughts and perceptions. Chronic use of mind-altering drugs can interfere with memory, attention, and perception. Mothers in our studies have had difficulty remembering their own children's birthdates.

Safety is an issue for family members, for professional staff who make home visits, and most of all for the children of substance-abusing families. Drive-by shootings and violence where drugs are used and sold are daily occurences in their neighborhoods. Further, children are often in danger because their addicted parents do not function as protectors and advocates. Infancy professionals who have been trained to acknowledge and respect that parents have a primary leadership role in their children's lives must learn to understand that the substance-abusing parent is often unable to assume this primary protective role. The first goal of professionals, therefore, is to keep the child visible in the community in order to monitor the child's safety in a dangerous drug culture."

Source: Howard, J., Beckwith, L, Rodning, C., Kropenske, V. (1989, June). The development of young children of substance-abusing parents: Insights from seven years of intervention and research. Zero to Three, 9, 8-12.

SUBSTANCE ABUSE AND TEENAGE PREGNANCY

In a 1989 study of 253 pregnant adolescents conducted at Boston City Hospital, the use of alcohol and illicit drugs was found to be "a common and sometimes frequent experience." According to the researchers, the group under study reflected the poor, predominantly black and Hispanic, unmarried population served at Boston City Hospital. Among their findings:

- one in six used cocaine during their pregnancies. Slightly over half used alcohol and just under a third used marijuana during their pregnancies.
- adolescent drug users had more of their social support provided by their male partners than nonusers.
- adolescent women who used drugs were nearly three times more likely than nonusers to report being threatened, abused, or involved in fights during pregnancy.
- drug use among pregnant adolescents was closely tied to their partner's drug use. For this reason, it is recommended that intervention and prevention efforts address both the adolescent mother and her male partner.
- the mother's drug use is often an attempt to cope with unhappiness and stress resulting from such difficulties as depression, poverty, poor social supports, and a variety of negative life events.

Source: Amaro, H., Zuckerman, B. and Cabral, H. (1989, July). Drug use among adolescent mothers: Profile of risk. Pediatrics, 84, 144-150.

THE RISK OF AIDS

In addition to other potential problems, the child exposed to drugs in utero is at greater risk for the Human Immunodeficiency Virus (HIV) infection, a precursor to AIDS. This is because women who use cocaine are at high risk for the AIDS virus, as a result of a life-style often characterized by promiscuous sexual behavior and exchange of sex for drugs. In addition, crack cocaine may be injected in order to sustain a lasting high, enormously increasing the risk of HIV infection by a contaminated needle. Studies suggest that 50% of infants born to mothers infected with AIDS or AIDS Related Complex (ARC) become infected. These children will require extensive medical and psychosocial care for as long as they live.

Source: Falloon, J., Eddy, J., Wiener, L. and Pizzo, P. (1989). Human immunodeficiency virus infection in children. Journal of Pediatrics, 114, 1-30.
and
The Far West Lab for Educational Research and Development, The Center for Child and Family Services, Sausalito, CA.

SUBSTANCE ABUSE, BONDING, AND ATTACHMENT

Bonding, the process by which an infant develops a sense of trust and attachment to a consistent caregiver, is essential for healthy psychological development. Attachment is defined by Kennell (1976) as " an affectionate bond between two individuals that endures through space and time and serves to join them emotionally." Attachment helps the child to:

- attain his full intellectual potential;
- sort out what he perceives;
- think logically;
- develop a conscience;
- become self-reliant;
- cope with stress and frustration;
- handle fear and worry;
- develop future relationships; and
- reduce jealousy (Fahlberg, 1979).

Bonding is often extremely problematic for newborns affected by alcohol and other drugs. These children typically face lengthy hospital stays, return to chaotic drug environments, or enter the foster care system, all circumstances interfering with the development of a strong, secure relationship between infant and mother or primary caregiver.

In addition, drug-affected babies are likely to have health problems, be difficult and demanding, and are less responsive and rewarding than even "difficult" babies. The inability of these babies to communicate their needs effectively, combined with frequently inadequate parenting skills on the part of the caregivers, makes bonding even more difficult. Magid and McKelvey (1987) describe this as the "vicious cycle of the non-responsive infant": When a child is not physically responsive, the mother wonders what she is doing wrong. As the mother's feelings of nervousness and anxiety grow, the child becomes more nervous and anxious, and withdraws even more from the mother. Thus, the cycle begins again.

Magid and McKelvey assert that the "vicious cycle" begins when "the infant has failed, sometime during the first year, to develop a strong internalized parent. As this cycle continues, babies fail to gain a sense of trust." In their review of the work on bonding and attachment, they found that the extent of psychological damage resulting from a failure to bond with a primary caregiver depends on three main factors. They describe them as:

> 1) **The age of the infant when the bonding cycle is broken.** The younger the infant, the more disastrous the break will be. The first months of an infant's life are the most important for the attachment process, although the process does not seem to be fully complete for about two years.
>
> 2) **The length of time the cycle is broken.** If a primary caregiver is gone from the child a relative few hours, little damage is done. But repeated day-long breaks, or breaks of several days or more, can result in an unattached child.
>
> 3) **The basic genetic predisposition of the particular child.** Just what role this plays has not been determined at this time." (p. 68)

The many problems facing babies prenatally exposed to alcohol and other drugs greatly threaten the establishment of a strong, secure bond and sense of attachment to a primary caregiver. The importance of this relationship between the infant and mother or primary caregiver cannot be understated, since it impacts on the child's physical, intellectual, emotional, and moral development. Clearly, the answer to the question of substance abuse during pregnancy lies in prevention. Researchers, practioners, legislators, and other citizens must work together to build a society in which the future of our children is everyone's top priority. Only in this way can the cycle of substance abuse and pregnancy end.

Sources: 1) Kennell, J., Voos, D. and Klaus, M. (1976). Parent-infant bonding. In R. Helfer and C.H. Kempe (Eds.), Child abuse and neglect. Cambridge, MA: Ballinger Publishing.

2) Fahlberg, J.V. (1979). Attachment and separation: Putting the pieces together. Michigan Department of Social Services, DSS Publication 429.

3) Magid, K. and McKelvey, C. (1978). High risk: Children without a conscience. New York: Bantam Books.

Chapter 4

WHAT IS THE ROLE OF THE SCHOOL?

- **Roles of the School Staff**
- **Identifying At-Risk Children**
- **A Model Program**

Chapter 4
WHAT IS THE ROLE OF THE SCHOOL?

Experts suspect that our educational system already contains significant numbers of substance-exposed children. Because these children are of normal intelligence, however, the subtle deficits affecting their performance may remain undetected. Early research with substance-exposed preschoolers, the oldest group of children being followed by researchers, shows they are unable to function effectively in a traditional school setting. Thus, without assistance, substance-exposed children appear to be at great risk for school failure and for dropping out of school.

Yet the proper school setting can make a great difference in the lives of children affected by their parents' substance abuse. Structure, consistency, and concern are important components of this optimal learning environment, along with a good deal of individualized attention. Teachers who work with substance-exposed children must be familiar with related neurological impairments that affect learning and behavior. Rather than working in isolation, they must also be willing to work as part of a multidisciplinary team. In model early intervention programs, the first substance-exposed children under study are responding to such an approach by learning and growing.

WORKING WITH SUBSTANCE-ABUSED CHILDREN: ROLES OF THE SCHOOL STAFF

The Teacher should:

- be supportive of various intervention techniques that work with drug-exposed children (see "Teaching Strategies" in this chapter).
- be open-minded and willing to try new and different methods to meet the child's needs.
- be ready to coordinate with a variety of different resources and agencies to assist the child's cognitive, physical, emotional and behavioral development.
- through patience, love and understanding, provide the environment in which the child can progress comfortably and in which sometimes reluctant parents can be encouraged to participate in their child's development.
- coordinate with other school-level support staff to provide a team approach for each child.
- be provided with information related to identifying and assisting substance-exposed children.

The Counselor should:

- be able to identify signs and symptoms of drug-exposed children.
- be aware of assessment techniques and instruction for use with the child and the family.
- be able to provide specialized guidance and counseling in the school setting.
- be able to provide support and guidance for other staff members.
- be aware of community resources for information and referral.

The Principal should:

- be knowledgeable about signs and symptoms of drug-involved children.
- be sensitive to special needs of drug-involved children.
- be aware of special curriculum and instructional techniques necessary for use with these children.
- be knowledgeable about the affective as well as academic needs of drug-involved children.
- be aware of sources of training for staff in dealing with drug-involved children (see below).

The Child Care Center, Pre-kindergarten, and Kindergarten Director should:

- be able to recognize that drug-involved children will need special consideration in both practice and curriculum.
- arrange to provide for such special consideration as far as possible within the center's means
- pay special attention to staffing.
- use innovative ways of involving parents or guardians.
- be willing to refer drug-involved children for diagnostic screening if necessary.
- make arrangements for outside assistance if deemed important to the child's overall development.
- make it his or her responsibility to follow through on a child's referral to an outside source since continuity of care is critical.

Source: Kate Howze, M.S. and Wendell Howze, Ed.D., personal communication.

Some Sources of Training in Florida:

- Linda Delapenha, Supervisor, Primary Diagnostic Services, Department of Student Services, Hillsborough County Schools, 411 East Henderson Avenue, Tampa, FL 33602, (813) 272-4576.

- Shirley Davis, Director, Child Development Center, Operation PAR, 10901-C Roosevelt Blvd., Suite 1000, St. Petersburg, FL 33176, (813) 577-9728.

- Kate Howze, Community Relations Specialist, Juvenile Welfare Board of Pinellas County, 4140 Forty-Ninth St. N., St. Petersburg, FL 33709, (813) 521-1853 .

- Wendell Howze, Assistant Principal, Northeast High School, 1717 54th Avenue, St. Petersburg, FL 33714, (813) 527-8441.

IDENTIFYING AT-RISK CHILDREN

The following list of behaviors was compiled by the staff of Los Angeles' Program for Children Prenatally Exposed to Drugs (PED). Substance-exposed children displaying these behaviors are at risk for school failure and a variety of related problems.

Perinatal Substance Abuse: Indicators for Early Intervention Services

Motor and Neurological Development

- tremulousness, tremors when reaching, increased startling
- poor quality of visual following
- poor visual attention to people and objects
- blanking out, staring spells, bizarre eye movement
- fine motor dexterity difficulty
- gross motor clumsiness

Affective and Behavioral Development

- lability of emotion, rapid shift from apathy to agressiveness
- irritable, hyper-sensitive, explosive and impulsive behaviors
- depressed affect, decreased laughter
- difficulty in comforting self and being comforted
- marked difficulty with transitions and changes
- increased testing of limits
  - -insists on doing tasks on own terms
  - -persistent refusal to comply to simple commands
- inability to self-regulate or modulate own behavior (easily becomes over-excited, cannot calm down)

Social/Attachment Development

- decreased use of eye contact to initiate social interaction
- decreased use of gestures to initiate social interaction
- decreased/absent stranger and separation anxiety
- indiscriminate attachment to new people
- aggressiveness with peers
- decreased compliance to verbal direction
- decreased response to verbal praise
- decreased use of adults for solace, comfort and object attainment
- decreased use of adults to gain recognition for accomplishments

Problem Solving, Attention and Concentration Strategies

- poor on task attention
- increased distractability to extraneous sounds and movements
- inability to accommodate in problem solving situations
  - impulsive responses before "reflecting"
  - persistent use of ineffective problem solving strategies, or easily "gives up" without trying other strategies
  - decreased visual scanning of all components in problem solving situations
  - decreased use of trial and error strategies
  - delay in acquisition of sense task completion

Language Development

- fewer spontaneous vocalizations from early infancy
- delayed acquisition of words
- decreased use of acquired words/gestures to communicate wants and needs
- prolonged use of "in-class" errors in picture/object identification at preschool level
- prolonged infantile articulation at the preschool level
- difficulty in "word finding" at the preschool level

Play

- shows decreased spontaneous play with increased aimless wandering
- does not apply acquired adaptive skills in spontaneous stacking, marking and container play
- cannot organize own play, appears perplexed and confused, cannot select materials and focus adaptively
- shows delays, discontinuity and disorder in representational play
- easily overstimulated by too many things and people and by too much noise
- has difficulty with peer relationships in unsupervised play

Source: Program for Children Prenatally Exposed to Drugs (PED) Team,
Los Angeles Unified School District, Division of Special Education
PED Team: Carol Cole, Teacher
Victoria Ferrara, Teacher
Teresa Garcia, Psychologist
Deborah Johnson, Psychiatric Social Worker
Marci Blankett Schoenbaum, Teacher
Rachelle Tyler, M.D.
Valerie Wallace, Psychologist

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A MODEL PROGRAM

The following is excerpted from "Today's Challenge: Teaching Strategies for Working with Young Children Pre-natally Exposed to Drugs/Alcohol", a booklet developed in July 1989 by the staff of the Children Prenatally Exposed to Drugs (PED) Program of the Los Angeles Unified School District. The booklet was designed to provide guidelines for preschool programs wishing to meet the needs of substance-exposed children. The teaching strategies are organized in the areas of learning, play, social/emotional communication and motor development, and home/school partnership. In addition to specific teaching strategies, there are descriptions of normal development as well as behaviors that place prenatally-exposed children at risk.

Overview

Background

The Los Angeles Unified School District, Division of Special Education, has initiated a pilot project serving twenty families in two classrooms at Salvin Special Education School and one at 75th Street School. The pilot serves children ages 3-6 who have been prenatally exposed to drugs (PED). Using a transdisciplinary approach, a team consisting of teachers, psychologists, social workers, speech and language specialists, adapted physical education staff, a physician, and a nurse offer services to children and families.

Purpose

The pilot is designed to determine the educational strategies that will be necessary to serve this high risk population. Ongoing assessments and documentaion help to identify the learning styles, behavioral characteristics and difficulties with bonding that are often found in these children. To promote understanding of these young children, special emphasis is placed on strengthening the home/school partnership, gathering and implementing data from related research, developing curriculum guidelines, providing parent/caretaker education and disseminating information to the community.

Entrance Criteria

1. Age: Three years, zero months to four years, zero months

2. Cognitive Ability: Overall functioning within average range

3. Medical: Prenatal exposure to drugs such as cocaine, PCP, heroin, etc. Children who have a medical condition such as a) seizures, b) deafness, c) blindness, d) severe mental retardation, e) severe physical disabilities, f) chromosomal abnormalities, that would qualify them for services on a special education site are not eligible for services in the PED program.

4. Behavioral Characteristics: Children may exhibit any of the following: tremors, perceptual disorganization, blanking out, speech and language disorders, minimal development delays, disorganized play, difficulty with transitions, poor peer relationships and poor coping skills.

Characteristics of Children Prenatally Exposed to Drugs/Alcohol

There is no "typical profile" of a drug-exposed child, and as such each child must be educated as an individual with particular strengths and vulnerabilities. Because the effects of prenatal alcohol or other drug use on children are varied, the continuum of impairment can range from minimal symptomology to severe impairment in all areas of the child's development. Characteristic behaviors include a heightened response to internal and external stimuli, irritability, agitation, tremors, hyperactivity, speech and language delays, poor task organization and processing difficulties, problems related to attachment and separation, poor social and play skills, and motor development delays.

While organic deficits caused by prenatal exposure to drugs cannot always be remediated, and while immunity against adverse child rearing conditions cannot always be created, high quality child/family intervention services can significantly improve a child's self esteem, self-control, and ability to solve problems in the real world.

Goals of the PED Program

1. *To develop a preschool program that incorporates a family focus, systematic interdisciplinary assessments, individualized programming, consistent teaching, support staff, and program evaluation.*

2. *To develop effective strategies and provide structured learning experiences to promote the cognitive, communicative, psychosocial, and motor development of children prenatally exposed to drugs including alcohol.*

3. *To identify preschool children who are at-risk for behavioral and developmental learning problems due to prenatal alcohol or other drug exposure.*
4. *To facilitate the succesful transition of Prenatally Exposed To Drugs, PED, children to a regular education setting or to their least restrictive special education program placement.*

5. *To promote a better understanding of young children who have been prenatally exposed to drugs including alcohol and who are at-risk for school failure.*

Philosophy of Program

The behaviors seen in the preschooler prenatally exposed to alcohol or other drugs are the result of a constellation of risk factors resulting from possible organic damage, early insecure attachment patterns, and ongoing environmental instability. The child is particularly vulnerable to many stresses that impact on daily living. The extremes observed in a child's behavior, be it passivity or hyperactivity, apathy or aggression, indiscriminate trust or extreme fear and suspicion, must be understood in the context of the child's experience.

Research has shown that the progress a child prenatally exposed to drugs is more favorable when the child is placed in a predictable, secure and stable environment; therefore, intervention programs for these children must include the development of protective environments with defined structure, expectations, and boundaries, as well as the provision of on-going nurturing and support. Early positive, responsive care is crucial for children's emotional and cognitive well-being. Establishing a strong attachment with each child through understanding and acceptance is a teacher's major priority. Only in the context of a good attachment will a child's true potential be realized.

Intervention strategies, to be effective, must attempt to counteract prenatal risk factors and stressful life events. To accomplish this, the teacher must build in protective factors within the classroom environment and provide facilitative ways for young children to cope appropriately with stress. Self-esteem, self-control, and problem solving mastery is best achieved when protective factors are coupled with a facilitative approach in the acquisition of better coping skills. These protective and facilitative factors are similar to those built into any good preschool program, but because children prenatally exposed to drug are more vulnerable, these program components are essential.

The following are protective factors to be built into a classroom for at-risk children:

A. Respect

Children at-risk need a setting composed of nurturing adults who are respectful of children's work and play space and who do not make unrealistic demands nor unpredictably appear and disappear.

B. Routines & Rituals

At-risk children need a setting which is predictable. Providing continuity and reliability through routines and rituals and scheduling activities to occur in a predictable order over time strengthen a child's self-control and sense of mastery over the environment.

In staffing programs for children at-risk, not all professionals (speech and language therapist, psychologist, social worker, etc.) come into the classroom weekly to interact with the children. These adults should develop a routine for reintroducing themselves and predicting for the children when they will appear again. Consistent personnel who help a child understand the visiting adult's schedule enhance the child's sense of security.

C. Observation & Assessments

The manner in which the child uses these skills during play, at transition time, and while engaged in self-help activities is equally important. Close observation of a child's behavior at these times allows for the understanding of how the child experiences stress, relieves tension, copes with obstacles, and reacts to change. It provides valuable information on how the child uses peers and adults to meet needs and solve problems.

D. Flexible Room Environment

Children at-risk need a setting in which classroom materials and equipment can be removed to reduce stimuli, or added, to enrich the activity.

E. Transition Time Plans

At-risk children need a setting in which transition time is seen as an activity in and of itself and as such has a beginning, middle, and end. Special preparation is given to transition time, recognizing that it is one of the best times of the day to teach the child how to prepare for and cope with change and ambivalence.

F. Adult:Child Ratio

Children at-risk need a setting in which the adult:child ratio is low enough to promote attachment, predictability, nurturing, and on-going assistance in learning appropriate coping styles.

The following are facilitative factors to be built into a classroom for children prenatally exposed to drugs:

A. Attachment

Children at-risk need a teacher who accepts the child with a history of both positive and negative experiences. It is assumed that for a high-risk child, there may be a history of poor attachments and lack of trust. The degree to which a child comes to trust the world depends, to a great extent, upon the quality of care received. When care is inconsistent, inadequate, or rejecting, it fosters mistrust, fear, suspicion, apathy, or anger towards the world and people in particular. These feelings will carry through to later stages of development.

B. Feelings

Children at-risk need a teacher who accepts that children have negative and positive feelings. Feelings are real, important, and legitimate. Children behave and misbehave for a reason, even if it cannot be figured out. In responding to a child's misbehavior, the first priority should be to acknowledge what the child seems to want, before dealing with the misbehavior. Doing so allows the child to recognize that his/her feelings are real and valid. Being understood facilitates self-esteem and promotes a willingness to function within prescribed limits.

Different children respond to stress (internal or external) in different ways. Individual children show different responses to the same stressful events on different days. Teachers need to develop a sensitivity to the particular meaning different stressors have for the individual child and not have a predetermined set of expectations for or responses to child behavior.

C. Mutual Discussion

At-risk children need a teacher who acknowledges that children's behavior, feelings and experiences are open to mutual discussion. Talking about behavior and feelings, (done with empathy rather than judgment) validates the child's experiences and sets up an accepting atmosphere. Permission to have these feelings leads to the increased ability to distinguish between wishes and fantasies on the one hand, and reality on the other. Verbal expression allows the integrating process that leads to the child's increased ability to modulate behavior, gain self-control, and express feelings.

D. Classroom Rules

Children at-risk need a setting in which the number of explicitly stated rules are limited. By limiting classroom rules, children are encouraged to explore and actively engage in their social and physical environment. While it is possible to teach specific objectives by relying on rules to control the child, it may be at the expense of the child's intrinsic motivation, problem solving capacity, and self-mastery.

E. Role Model

Children at-risk need a teacher who understands that by establishing an individual, trusting relationship, the teacher becomes an important person, and behavior the teacher models is more likely to be imitated.

F. Peer Sensitivity

At-risk children need a teacher who realizes that children become sensitive and aware of the needs and feelings of others only by repeatedly having their own needs met.

G. Decision-Making

Children at-risk need a teacher who recognizes that it is important that they be allowed to make decisions for themselves. Freedom to choose and to assume the responsibility for those choices gradually expands the in view of the child's physical, social, emotional, and intellectual growth and promotes self-esteem, problem solving mastery, and moral values.

H. Home

The home is recognized as an essential part of the curriculum. Facilitating parental/ caregiver goals helps to establish a close working relationship between home and school. Intervention strategies that strengthen the positive interaction between child and family increase parental confidence and competency.

I. Program

Program intervention is best achieved when all professionals concerned with the child and family are coordinated. To accomplish this successfully, time must be allotted for teachers to meet and plan with assistants and for support services of social workers, psychologists, speech and language, and adaptive physical education to come together in a transdisciplinary model.

Teaching Strategies

A. Learning

Learning occurs in a developmental framework. Development is an internal process in which the child is consistently organizing and reorganizing experiences within a continuum of stages. Movement through the stages is not an automatic passive activity. From birth, a child who has not been exposed to drugs/alcohol has the potential to attend and respond to selected stimuli and take the initiative to explore and control the environment.

Competency to perceive and explore the environment can be damaged in the child prenatally exposed to drugs/alcohol. Concrete experiences, decision-making and problem solving within a nurturing environment as well as a positive interactive communication help to build the foundation for development. This foundation promotes self-esteem, competence and motivation for new learning.

NORMAL LEARNING DEVELOPMENT

The child:

- *learns to focus on tasks in play situations.*
- *uses numerous problem-solving strategies.*
- *shows sustained attention in individual and small group activity.*
- *develops a sense of task completion.*
- *steadily progresses in the acquisition of skills.*
- *learns to delay immediate needs and to conform to the social expectations of the classroom.*
- *is able to end a preferred activity and start a teacher-directed activity.*
- *demonstrates sporadic/intermittent mastery of skills in new learning situations.*
- *acquires pre-academic concepts through incidental learning.*

LEARNING BEHAVIOR OF AT-RISK CHILDREN

The child:

- *may easily be distracted by sounds, people, and movement.*
- *may have poor visual scanning.*
- *may show decreased trial and error.*
- *may show decreased problem-solving strategies.*
- *may have decreased attention and concentration.*
- *may show perseverative behavior in problem solving.*
- *may show decreased task completion.*
- *may need longer time to complete task.*
- *may give up easily when confronted by problem-solving situations.*
- *may be easily frustrated and become irritable in problem-solving situations.*
- *may be unable to do task previously mastered.*
- *may be unable to take turns.*
- *may not remain seated in circle or at the table with the other children.*
- *may withdraw from a lack of social and environmental stimulation and may learn to become non-responsive.*
- *may not have regular play/rest cycles or patterns.*
- *may become upset with changes in routine.*
- *may have difficulty with changes/transitions.*
- *may be unable to end or let go of preferred object or activity.*
- *may demonstrate sporadic/intermittent mastery of skills over prolonged period of time.*
- *may not learn incidentally.*

TEACHING STRATEGIES FOR OPTIMAL LEARNING

Teaching staff:

- *provides support and emotional reassurance.*
- *reduces classroom interruptions as much as possible.*
- *limits number of objects in room.*
- *establishes classroom routines with minimum number of transitions.*
- *models alternative strategies.*
- *directs child to watch another child who is using a successful strategy.*
- *considers developmental level of child.*
- *recognizes preschoolers may need to sit in adult's lap.*
- *recognizes preschoolers may need to sit next to an adult.*
- *uses physical, concrete, and verbal cues to direct or redirect child in task or activity.*
- *recognizes and consistently praises child's attempts and accomplishments.*
- *asks child to verbalize steps of a task.*
- *provides verbal cues (talks the child through task) if child is unable to verbally give steps of task.*
- *provides the child with an opportunity to take turns with peers and adults.*
- *models taking turns.*
- *provides attention and time to children who are behaving appropriately.*
- *protects child from the over-stimulation of intrusive persons or noisy environments and from the under-stimulation of a bland social and environmental experience.*
- *provides the child a schedule of play and rest activities to help develop regular patterns.*
- *alerts the children routinely 1-2 minutes ahead of time that the activity will soon be over.*
- *talks about the next activity before entering into the activity.*
- *allows adequate time for the transition activity.*
- *guides the child through the transition and into the next activity.*

B. Play

Play is the area where a child integrates learning, communication and social/emotional and motor skills. Through play, a child can learn to understand him/herself and the relation to others and the world around him/her. As a child grows and matures his/her play involves increased communication skills, attention, concentration, and concept development. Strategies for play are important because a child prenatally exposed to alcohol and other drugs is at-risk for poor play skills.

NORMAL DEVELOPMENT PLAY

The child:

- *learns to organize his/her own play.*
- *can independently select materials and focus on them in an appropriate manner.*
- *progresses from parallel to interactive play.*
- *joins in play with other children.*
- *initiates interactive play.*
- *takes part in and initiates dramatic play.*

PLAY BEHAVIOR OF AT- RISK CHILDREN

The child:

- *may show decreased spontaneous play with increased aimless wandering.*
- *may not organize own play, appear perplexed and confused and cannot select materials and focus adaptively.*
- *may be easily over-stimulated by too many things and people and by too much noise, movement and excitement.*
- *may show delay, discontinuity, and disorder in representation play.*
- *may have difficulty joining others in play.*
- *may not initiate appropriate interactive play.*
- *may not initiate dramatic play.*

TEACHING STRATEGIES FOR OPTIMAL PLAY DEVELOPMENT

Teaching staff:

- *gives child toys and/or areas in the classroom that are child's alone, and do not have to be shared.*
- *recognizes that the child may not have had consistent play objects in his/her environment.*
- *finds out what is available for the child in child's home.*
- *decreases/regulates amount of toys for child.*
- *responds to and follows the child's lead in play.*
- *models toy choices for child with correct verbal cues.*
- *verbally and physically models play with toys.*
- *provides opportunities for the child to play interactively in a safe environment with the adult available for assistance and reassurance.*
- *provides child with opportunities to take turns with peers and adults.*
- *provides time to model interactive play.*
- *provides child with support and encouragement during play.*
- *initiates and models dramatic play with child.*
- *responds to child when child initiates dramatic play by verbal responses or by playing with the child.*

C. Social/Emotional

When interactions between the drug exposed infant and caregivers result in lack of attachment rejecting or inconsistent care, this child is at greater risk for developing mistrust, suspicion and fear. These attitudes may carry through to later stages of development and manifest themselves behaviorally. Exaggerated behavior patterns are often the way a child copes with a situation that is overwhelming. Each child must be made to feel emotionally safe to attempt new learning. It is important to establish a responsive, nurturing environment conducive to active learning in which the child may build a positive self-concept.

NORMAL SOCIAL/EMOTIONAL DEVELOPMENT

The child:

- *develops and maintains healthy attachments.*
- *separates from parent when trust has been established.*
- *learns to look for and respond to adult approval.*
- *learns to respond to gestural/verbal praise and setting of limits by teacher.*
- *forms attachment to teacher.*
- *learns to socially signal desires and needs.*
- *learns to interpret and respond to social cues of adults.*
- *learns to read and respond to social cues of peers.*
- *shows broad range of emotions, including pleasure, anger, fear, curiosity, and assertiveness.*
- *shows a balance in emotions.*
- *learns to regulate own inner-state.*
- *reponds to emotions of others.*
- *learns to develop an independent sense of self and responsible behavior resulting in self-esteem.*
- *develops a strong self-interest.*

SOCIAL/EMOTIONAL BEHAVIOR OF AT-RISK CHILDREN

The child:

- *may not use adults for comfort, play, approval, or object attainment.*
- *may go from one to another showing no preference for a particular adult.*
- *may not look to adult for recognition of a job well done.*
- *may not respond in any way to verbal praise from adult.*
- *may ignore verbal/gestural limit setting.*
- *may show decreased compliance with routine simple commands.*
- *may show indiscriminate attachment to all adults.*
- *may not signal desires by giving eye contact, gesturing, or vocalizing.*
- *may not read teacher's cue/look.*
- *may show a restricted range of emotion.*
  - *overreacts to "no" by total withdrawal.*
  - *rarely smiles, laughs, or show joy.*
  - *lethargy, listlessness, lack of affect.*
  - *clingy behavior with adult.*
- *may not express fear, grief, worry.*
- *may withdraw, seem to daydream, or not be there.*
- *may have poor inner controls (giggles turn into screams).*
- *may remain clingy and dependent on teacher for decisions and daily living activities for extended periods of time.*
  - *may overreact to separations from primary caregiver.*
  - *may show some lack of self-awareness as an individual.*
- *may not show concern for hurt peers.*

TEACHING STRATEGIES FOR OPTIMAL SOCIAL/EMOTIONAL DEVELOPMENT

Teaching staff:

- *provides opportunities for contact, mutual touch, and smiling throughout the day.*
- *responds to specific needs of child with predictability and regularity.*
- *addresses child by name, elicits eye contact, and/or touches child before giving verbal command.*
- *talks child through to consequence of child's action.*
- *provides the child with explicitly consistent limits of behavior.*
- *takes every opportunity to develop teacher child relations.*
- *uses close proximity and gestures.*
- *responds to muted signals and gives child a verbal explanation of child's behavior.*
- *moves close to the child, looks at the child, and helps the child to read teacher's cues by explaining to the child what the teacher's look, body language, or gesture means.*
- *labels expression of emotions so child learns to identify those emotions.*
- *uses books, pictures, doll play, and conversation to explore and help child express a range of feelings.*
- *allows, identifies, and reacts to child's expression of emotions:*
  - *pleasure*
  - *protest*
  - *excitement*
  - *anger*
  - *self-assertion*
  - *curiosity*
  - *dependency*
  - *love*
  - *fear*
- *models full range of emotions for child.*
- *communicates with caregiver and finds out if there has been an upset in the home or any change of routine in the home, any family emergency or if the child's sleeping pattern has changed.*
- *assists child in gaining control by:*
  - *getting eye contact.*
  - *sitting next to the child.*
  - *verbal reassurance.*
  - *physical comfort, (i.e., teacher rubs child's back).*
- *uses stories, puppets, and role play to develop empathy for others.*
- *provides daily opportunity for the child to practice independent feeding, dressing, bathing, toileting, and play skills with tolerance for messiness and dawdling.*
- *provides child with a daily opportunity to make small decisions and limited choices in play and/or self-help activities.*
- *has activities centered around the child as an individual.*
- *provides spaces and objects in the classroom that are for each child (cubbies with names, personal toys from home, and individual picture books).*

D. Communication

The child's capacity to communicate evolves from early mother-child interaction. The development of a child's language depends on the child's ability to receive, understand, integrate, and express meaningful experiences. The child learns to use gestures/words to express feelings, communicate wants, and describe experiences. A child learns language best through social interaction with significant individuals and through active exploration of his/her environment.

NORMAL COMMUNICATION DEVELOPMENT

The child:

- *is able to follow directions appropriate for his developmental level (simple commands, multiple commands).*
- *learns to communicate simple wants and needs, name objects, express feelings at appropriate developmental levels, and describe experiences and events.*
- *is able to use pragmatic language.*
- *learns to initiate appropriate interactions with peers.*

COMMUNICATION BEHAVIORS OF AT-RISK CHILDREN

The child:

- *may have delayed receptive and expressive language.*
- *may be unable to follow directions that are appropriate for the child's developmental level.*
- *may have prolonged infantile articulation at the preschool level.*
- *may not use attained language to communicate feelings, wants, and needs.*
- *may be unable to verbalize his/her needs, wants and fears, and expresses them through behavior such as banging, stomping, shouting.*
- *may show listlessness, passivity, and/or lack of social awareness.*
- *may observe rather than verbally engage with peers in play.*
- *may inappropriately initiate interaction with peers by:*
  - *hitting*
  - *pushing*
  - *biting*
  - *swearing*
  - *negative verbal remarks.*

TEACHING STRATEGIES FOR OPTIMAL COMMUNICATION DEVELOPMENT

Teaching staff:

- *creates a stable environment where child feels safe to express feelings, wants, and needs.*
- *uses "hands-on" activities to reinforce the child's language.*
- *uses eye contact, gives simple one step directions, and gradually increases the number of steps in a direction.*
- *maps language in the context of the activity.*
- *provides names of people, pets, food items, body parts, objects, feelings, and everts in the process of conversation.*
- *immediately responds to beginning attempts at verbal communication.*
- *investigates child's behavior by asking child questions to discover what child needs, wants, or fears.*
- *acknowledges the needs, wants or fears of the child.*
- *provides strategies to enable the child to appropriately express needs, wants, or fears.*
- *acknowledges attempts by child to cooperate and interact with other children.*
- *recognizes negative behavior may be a signal of child's unmet needs.*
- *reflects child's feelings.*

- *verbally directs child's behavior.*
- *praises child's attempts toward adaptive behavior.*
- *ignores inconsequential verbal behavior.*
- *verbalizes expected behaviors.*
- *redirects behavior.*
- *removes child and helps child calm self.*
- *provides child verbal language to use with other children.*
- *intercedes with extra support for child who has used best developmental skills to resolve conflict without success.*
- *sets consistent limits on inappropriate behavior, but allows for expression of feelings.*
- *provides time to talk with child about emotions.*

E. Motor

Motor and spatial development stems from the interplay of a number of factors beginning prenatally and continuing through early childhood. Any major interferences along this continuum can result in motor/spatial impairment. As a result of prenatal exposure to alcohol and other drugs, the child may exhibit varying degrees of fine, gross motor, and spatial relationship delays.

NORMAL MOTOR/SPATIAL DEVELOPMENT

The child:

- *has awareness of child's body placement in relationship to his/her environment.*
- *has age appropriate gross motor skills.*
- *has awareness of space relationships among objects in relationship to self.*
- *has awareness of space relationship among objects in relationship to each other.*
- *is able to manipulate objects, age appropriately.*

MOTOR/SPATIAL BEHAVIOR OF AT-RISK CHILDREN

The child:

- *may trip or stumble without apparent cause.*
- *may have difficulty with gross motor skills (e.g., swinging, climbing, throwing, catching,*
- *jumping, running, and balancing).*
- *may walk into stationary or moving objects.*
- *may move too close or too far away from another object.*
- *may show splaying of fingers, immature grasping skills.*
- *may have difficulty manipulating objects (stacking, stringing, cutting, and drawing).*
- *may exhibit tremors when stacking, stringing, or drawing.*

TEACHING STRATEGIES

Teaching staff:

- *verbally reminds child of obstacles.*
- *guides child through motor activities that emphasize the skills of rhythm, balance, and coordination.*
- *models and guides child in learning to control child's body through songs, games, and play.*
- *provides child with opportunities to experience spatial relationship through motor mazes, outdoor play, and indoor play.*
- *provides a variety of tactile and small motor activities (water and sand play, pegboards, puzzles, blocks, legos, etc.).*
- *observes child and notes tremor occurrences and duration and how child compensates for tremors.*

F. Home-School Partnership

The home is recognized as an essential part of the curriculum. Research has indicated that early intervention programs are essential in producing long-term positive results only when parents/ caregivers are part of the program design. Interactions between teachers and parents/caregivers must be professional, sensitive, and flexible. This relationship must be based on the expression of mutual concern and goals. Parents of children at-risk may themselves have past and/or present experiences which can compromise their ability to effectively parent their children. Factors, which may include poverty, depression, a history of child abuse/neglect, family instability and violence, history of psychiatric problems, drug abuse, etc., are taken into consideration when staff is addressing the child's needs with the parent.

Children who reside in foster homes or are placed with extended family members are particularly vulnerable to the consequences of separation, loss, and poor attachments. These children require on-going support and coordinated case management plans with the goal of maximizing the child's success within the home and in the school. The emphasis on strengthening the positive interaction between caregiver and child increases the caregiver's awareness and understanding of the child's individual needs and assists in promoting feelings of confidence and competency within the caregiver. This empowerment of the caregiver will benefit the child far beyond his/her formal school program.

Having the knowledge of school/community resources and a genuine interest in the parent's well-being are essential to bridging the home-school partnership.

HEALTHY HOME ENVIRONMENT

The child:

- *will have a mother who receives proper prenatal care.*
- *is provided consistent, responsive primary caregiver from birth.*
- *is provided predictable, safe, stable environment.*
- *has regular eating and sleeping patterns.*
- *will have a mother/primary caregiver who sees herself as child's first teacher.*
- *is provided with established family rituals around daily living activities and special events.*
- *is provided appropriate developmental activities.*
- *is encouraged to express feelings.*
- *is encouraged to be self-sufficient and independent.*

AT-RISK ENVIRONMENT

The child:

- *with prenatal exposure to drugs/alcohol may:*
  - *be premature*
  - *be small for gestational age*
  - *go through withdrawal*
  - *suffer damage to gastrointestinal, endrocrine, respiratory genito-urinary, cardiovascular and/or central nervous systems.*
- *may have multiple home placements.*
- *may have multiple caregivers.*
- *may live with other young children who are at-risk.*
- *may be abused and neglected.*
- *may receive inconsistent and intermittent nurturing.*
- *may have caregiver who is emotionally unavailable.*
- *may have caregiver who is overwhelmed or untrained in dealing with the child's emotional needs.*
- *may be exposed to chaotic, unpredictable, and unstable environments.*

TEACHING STRATEGIES OPTIMAL HOME-SCHOOL PARTNERSHIP

Teaching staff:

- *identifies family constellation and primary caregiver.*
- *develops relationship with caregiver and lines of communication.*
- *schedules on-going visits to:*
  - *develop a child's history (number of placements, medical history, family history, other agency involvement).*
  - *explore what they are doing about child's behavior.*
  - *discuss observations of child's behavior and progress.*
  - *observe and discuss caregiver/child relationship.*
  - *identify parental concerns and assess family needs.*
  - *develop individual family service plan.*
  - *facilitate referral to other agencies as services are needed.*
  - *encourage participation in parent education classes.*
- *discusses and models the importance of predictability and organization:*
  - *by developing a transition plan with caregiver for entering school (books, toys, expected parent attendance).*
  - *by establishing regular patterns of communications with home (phone calls, classroom newsletter, informal notes, notebook back and forth).*
  - *by anticipating, discussing and integrating events at home and school (daily routine, special events).*
  - *by discussing implications of prenatal exposure to drugs/alcohol (short-term and long-term effects).*
  - *by promoting an understanding of psychosocial risk factors (abuse, neglect, mutiple placements).*

A Teacher's Personal Account

Young Children Prenatally Exposed to Drugs in the School Setting
by Carol Cole, M.A., Teacher, Los Angeles Unified School District

Children prenatally exposed to drugs entering the preschool setting bring with them a constellation of risk factors. The behaviors seen in the classroom may be the result of possible organic damage, early insecure attachment patterns, and often ongoing environmental instability. These children are particularly sensitive to the many stressors that impact on their daily lives. The extremes observed in a child's behavior, be it passivity, hyperactivity, apathy or agression must be understood in the context of the child's experience. The average child in our pilot program had approximately three placements by three years of age.

When we began three years ago, we were aware that the literature described babies prenatally exposed to drugs as having a poor arousal response, being difficult to soothe, showing poor organization to environmental sounds, and being poor eaters and sleepers. We read that drug using mothers had a history of poor prenatal care, dysfunctional relationships, chaotic lifestyles and poor parenting skills.

What we didn't know was how the developmental line of vulnerabilities or impairments would manifest themselves in the three and four year old child in the school setting. We thought we could pinpoint different behavior and attribute it to a particular drug. We also thought we might be able to tease out the effects of the drugs from those environmentally induced difficulties. We could not. The children

are the product of poly drug abuse in utero, the abuse occurring at different times during the pregnancy, for different durations and at different intensity while in the womb. Perhaps, more importantly, we could not clearly distinguish the difference between the impact of the drug and the impact of the environment.

> *Three year old C. was reported to have been exposed to cocaine, pcp, and alcohol in utero. In school, he knew his colors, and was beginning to read. Yet, often, his response to simple teacher demands to participate in chassroom activities and routines would result in temper tantrums, foul language, drooling, spitting, and undressing. C. lived in a group home for six children, all under the age of five. There was a rotating staff of nine caregivers. This was the 8th placement that C. had experienced in his short three years. Was the inappropriate behavior we saw in the classroom the result of the drugs or because of the multiple placements . . or was it both?*

We have learned that these children are more alike than different from their typical peers and that while we know drug exposure can cause a continuum of impairments, from severe handicapping conditions to risk factors, there is no typical profile. Likewise, there is no typical generalization that can be made about the families and caretakers of these children. Both must be served with sensitivity to their unique strengths as well as needs. Children prenatally exposed to drugs are not atypical or dissimilar from other vulnerable children. However, the combination of both organic and environmental insults leaves these children in need of specialized curriculum and services. These children's cognitive competence is often not enough to protect them from school failure. Therefore, specialized, but not necessarily separate from other high risk or typical children, early intervention is necessary for these children.

The intervention strategies, to be effective, must attempt to counteract prenatal risk factors and stressful life events. School curriculum and social services provided these children must incorporate the basic principles of building attachment and trust.

The beginning of moral development for children rests in part with the degree to which they learn to trust the world . . . and of course the people in that world. Attachment is the word we use, the shorthand, to convey that a child has that base of trust. Attachment is the initial building block for all learning: cognitive, emotional, behavioral . . . It is fundamental for extending simple cause and effect knowledge into the more complex realm of socially appropriate behavior and abstract thinking. Research indicates that one person, advocating for a child can have tremendous influence in the outcome of that child.

Our experience is that a majority of children coming into our program have a history of poor attachment and lack of trust. Therefore, it is a major priority for teachers to establish a strong relationship with each child and family. A major focus is not just school readiness skills, but rather on relationships and attachment. Teachers modeling concerned nurturing, predictable interaction with respect for feelings can teach a lesson far more important that colors, numbers, letters, size and shape. That is:

- adults can be trusted
- needs will be met
- children are valued

Hillsborough County's Response: The Drug-Exposed Children's Committee

The Drug-Exposed Children's Committee (DECC) in Hillsborough County, Florida, investigated the needs of young children exposed to alcohol and other drugs to see if modifications were needed within regular education/pre-school programs. An informal assessment was conducted in May 1989, to see if there were children in kindergarten Head Start and other pre-kindergarten programs who were thought to be drug-exposed, and to see the kinds of problems they were experiencing. Schools with "at risk" populations did have drug-exposed students and hypotheses were generated about possible problems.

A five year longitudinal study of children from three to six years of age is currently being implemented. If we are successful in validating our pre-K and kindergarten checklist for symptomatic behaviors, children will be selected for the study based on teacher observation. The Committee has developed a checklist of behavioral characteristics associated with prenatal exposure, compiled from data from Los Angeles City Schools, research, and our own observations. Drug exposure will be validated by a parent interview. Initial funding for the study is provided by the University of South Florida Institute for At-Risk Infants, Children, and Their Families. The number of children identified for study during the 1989-90 school year will be determined by the level of funding received. Descriptive data will then be collected for all children in the study, such as screening test scores, promotion/retention data, teacher observations, etc., over a five year period of time.

This Committee is actively providing inservice to teachers and other school personnel to allay their fears of this problem, and to present current research and information. A staff development component has been written to address Teaching Strategies for Children Pre-natally Exposed to Drugs. The syllabus is being developed with September 1990, as a target date for offering the course through the Teacher Education Center for re-certification credit.

Source: Linda Delapenha, Member
Drug Exposed Children's Committee
(DECC) of Hillsborough County
Supervisor, Primary Diagnostic Services
Hillsborough County Schools, Florida

Operation PAR's Child Development and Family Guidance Center

Since 1971, Operation PAR has addressed the problems of drug and alcohol abuse in Pinellas County, Florida. Operation PAR's Child Development and Family Guidance Center provides innovative, comprehensive, community-coordinated services designed to serve infants and children affected by parental chemical dependency. Working with the local county health unit, pediatricians, child protection teams, state protective services, juvenile court services, and chemical dependency treatment teams, the program strives to prevent multigenerational chemical dependence.

One component of the program is a special center serving children of two months to five years whose parents are serious drug abusers, especially parents abusing cocaine. The children participate in a wide variety of learning experiences designed to assess and develop their physical, emotional, social, creative, cognitive, language and self-help skills.

Infants and pre-school children are assisted to:

- feel secure in a healthy and safe environment.
- develop or enhance primary and trust relationships.
- nurture and grow in a positive social environment where satisfying interpersonal relationships can be developed through interaction with peers and adults.
- develop effective verbal and non-verbal communication skills.
- improve self-concept and self-esteem.
- improve perceptual motor activity.
- express feelings and perceptions, and enhance creativity through music, art, drama and dance therapy.

Each child is given a comprehensive screening to determine his or her developmental competencies. Children who have indicators of serious development deficits are further tested in order to determine appropriate educational and intervention plans. All children have personalized learning objectives developed with their parent(s) and ongoing evaluation to determine progress toward meeting individual goals. All parents participate in seminars and educational classes designed to enhance their potential skills and competencies.

For more information, call Shirley Davis, Director, Child Development and Family Guidance Center, (813) 896-2672.

Chapter 5

WHAT IS THE ROLE OF OTHER HELPING PROFESSIONALS?

- Florida's Reporting Requirements
- A Continuum of Services in Florida
- Legal Issues

Chapter 5
WHAT IS THE ROLE OF OTHER HELPING PROFESSIONALS?

Florida's new reporting requirements (see below) increase the likelihood that prenatally-exposed children and their families will come into contact with a wide range of helping professionals by the time these children reach school age. In Florida, sustained and systematic effort to assist high-risk children below age five is generally considered "early childhood intervention". Studies show that children affected by prenatal exposure to alcohol and other drugs are significantly helped by early intervention designed to meet their particular needs. Such intervention is particularly effective when interagency cooperation and coordination of services exists. According to Samuel Meisels of the University of Michigan:

> "...early intervention incorporates a host of services and service providers that cut across several disciplines and orientation...medicine, education, social work, social services, child care, respite care, public health, speech and language, occupational and physical therapy, nursing and psychology. Indeed, in order to achieve a thorough understanding of early intervention, one must adopt a set of assumptions that emphasize this plurality."

Both state and federal governments have made early intervention a priority through legislation which emphasizes the importance of timely and coordinated care. Although such postnatal intervention is essential to preventing even greater problems, prevention is, of course, best achieved prior to the conception of the child through activities such as teen parent and dropout prevention programs and curriculum courses that build self-esteem and healthy practices in future parents. Early childhood experts point out that this kind of proactive education is the most fundamental approach to the problem of substance abuse during pregnancy.

SUBSTANCE-EXPOSED NEWBORNS: FLORIDA'S REPORTING REQUIREMENT

Between 1963 and 1965, all fifty states enacted laws requiring physicians and other health care workers to report known or suspected child abuse to local protective services departments. States receive federal funds contingent on the existence of such statutes. In Florida, the definition of "child abuse" extends to instances in which a newborn has been exposed in the womb to drugs other than those administered as part of a detoxification program or in conjunction with medically-approved treatment procedures. (Florida Statutes, 415.503)

The means for reporting and referring newborns whose mothers used drugs during pregnancy is specified in the Florida Department of Health and Rehabilitative Services (HRS) regulation 150-6: Substance Abused Newborns. Excerpts from HRS Regulation 150-6 explain the procedure:

HRS Regulation 150-6: Substance Abused Newborns

1. Purpose. This policy provides for a system of identification, reporting and provision of needed services to drug or alcohol involved newborns, and babies born to mothers who are addicted to or abusing drugs or alcohol.

2. Effective Date. October 15, 1988

3. Scope. The Department of Health and Rehabilitative Services shall be informed of all newborn infants who are born to mothers who are addicted to or have abused drugs during the childbearing period in the following manner:

a. Report of Physically Drug Dependent Newborn

(1) If anyone has reasonable cause to suspect that a newborn is physically drug dependent or a situation of actual or threatened harm exists, this knowledge or suspicion must be reported immediately to the FLORIDA ABUSE REGISTRY (required by F.S., 415.504 (1)).

(2) The abuse registry shall notify the district Child Protective Investigation Unit which will commence an immediate child protective investigation. The child protective investigator will inform the county public health unit which will conduct a separate home evaluation and family assessment.

b. Referral of Other At Risk Newborns with Related Substance Abuse Concerns.

If no child abuse is threatened, physical drug dependency or harm suspected, but there is a substance abuse concern with the newborn or family, the attending health professional should make a referral to the district or county public health unit for a family assessment and service provision through the district telephone network. The consent of the client is required for this referral. The primary responsibility for the health care of these families will be assumed by the public health nurse.

4. Explanation of Terms

a. Child Abuse. This team refers to situations in which a child's physical, mental and emotional well-being is harmed or threatened with harm by the acts or omissions of a parent, other person responsible for the child's welfare or institutional staff; it includes sexual abuse. (F.S., 415.503 (3))

b. Child Protective Investigator (CPI). The department's authorized agent located in each district within the state and responsible for conducting child protection investigations of allegations that children have been abused or neglected by a parent or other person responsible for their welfare or institutional staff.

c. Harm to Children. This term includes, but is not limited to an injury of a newborn infant evidenced by that infant's being born physically dependent on certain controlled drugs and actual or potential failure of a parent to supply a child with adequate food, clothing, shelter, supervision or health care, although financially able or offered financial or other means to do so. (F.S., 415.503 (8))

d. Health Care Case Manager. The health care case manager, who is usually the public health nurse, plans and provides nursing care, referrals, follow-up, monitoring, education, counseling and coordinates other activities necessary to enhance the wellbeing of the family.

e. District Telephone Network. The district telephone network is the system for receiving referrals of substance-abused newborns directly from health care providers and child protective investigators. Each district should ensure that every hospital and birth center has the appropriate telephone number for referrals to the district or in some areas, the county public health unit. The district office shall establish and maintain a plan for timely referral to the county public health unit.

f. Physically Drug Dependent Newborn. A physically drug dependent newborn is an infant under 28 days of age who exhibits abnormal growth or, abnormal neurological patterns or, abnormal behavioral patterns, and for whom there is documented evidence that the mother used Schedule I or II drugs during her pregnancy. Documented evidence for this condition is: Admission by the mother of drug use during pregnancy, a positive maternal drug screen during pregnancy or the early postpartum period or a positive newborn drug screen.

g. Reasonable Cause to Suspect. Indicators for reasonable cause to suspect that a newborn is physically drug dependent are:

1. Directly observing the pregnant woman while she is using drugs. This should be by a relative, household member or other reliable source.

2. Admission by the mother of drug use during pregnancy.

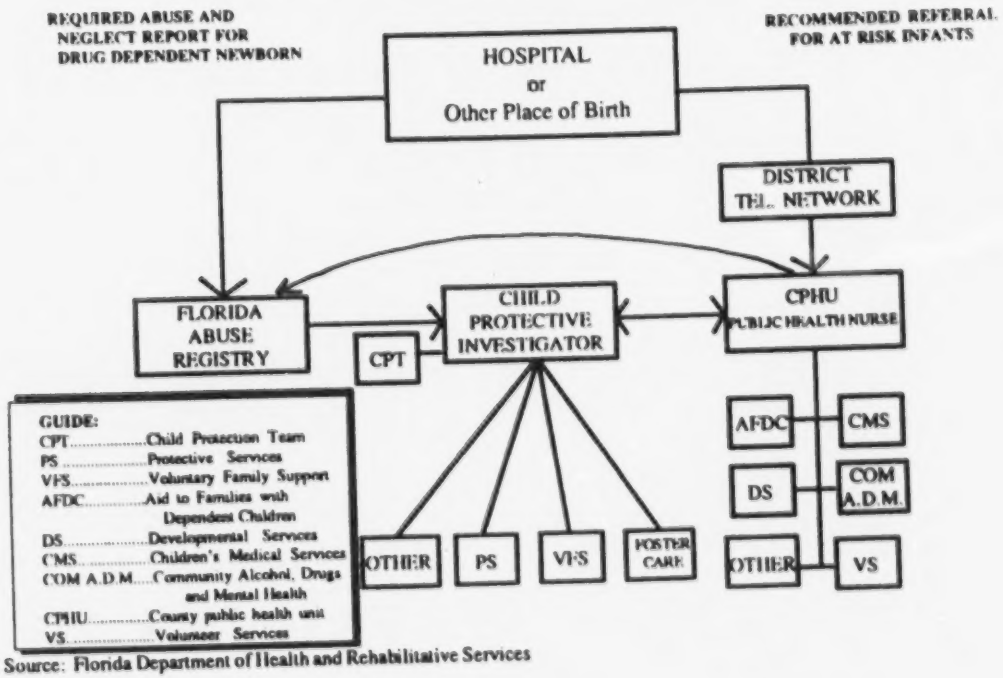
3. A positive drug screen of the newborn.

4. A positive maternal drug screen during pregnancy or the postpartum period.

h. Reports to the FLORIDA ABUSE REGISTRY. The FLORIDA ABUSE REGISTRY'S statewide single number (1-800-96 ABUSE) should be utilized for the reporting of all suspected child abuse or neglect.

REPORTING AND REFERRING SUBSTANCE-ABUSED NEWBORNS

THE REPORTING AND/OR REFERRAL OF SUBSTANCE ABUSED NEWBORNS



Source: Florida Department of Health and Rehabilitative Services

A CONTINUUM OF SERVICES IN FLORIDA

Increasingly, legislators and citizens are turning to prevention as a solution to many social problems. Such is the case with Florida's 1986 Handicap Prevention Act, which asserts that 50 percent of handicapping conditions in young children can be prevented or minimized by "focusing preventive efforts on high-risk pregnant women and high-risk and handicapped young children, in the formative years of 0 to 5, and their families"(F. S., 411.102). Interagency and intraagency program coordination are seen as indispensible means of achieving this goal.

The Act directs the Departments of Education (DOE) and Health and Rehabilitative Services (HRS) to work together to identify and refine a continuum of early assistance services that contribute to the prevention of handicapping conditions in young children. The result is Florida's Handicap Prevention Report, which, among other things, describes a full array of prevention and intervention services currently provided at the state and local levels. As such, it is an extremely valuable resource for educators and other helping professionals working with drug-involved parents and prenatally-exposed children.

The Continuum of Services

The continuum of preventive and early assistance services described in Florida's Handicap Prevention Report serves as a guide for a comprehensive statewide approach to services for high-risk pregnant women and for high-risk and handicapped children and their families. The continuum includes the following categories of services:

1. Education of the Public and Professionals
2. Family Support Services Prior to Pregnancy
3. Maternity and Newborn Services
4. Health Services for Newborn Children
5. Early Intervention, Education and Related Services for High-Risk and Handicapped Preschool Children
6. Support Services for High-Risk or Handicapped Children and Their Families

Definition of High-Risk Children

Beginning July 1, 1989, the definition of the "high-risk" or "at-risk" child was broadened as part of the Florida Prevention, Early Assistance, and Early Childhood Act (CSHB), a major rewrite of the Handicap Prevention Act (F.S. 411). In relation to prenatal substance exposure, a "high-risk" or "at-risk" child means a preschool child who:

- is a victim or a sibling of a victim in a confirmed or indicated report of child abuse and neglect.
- is a graduate of a perinatal intensive care unit.
- has a parent or guardian who is developmentally disabled, severely emotionally disturbed, drug- or alcohol-dependent, or incarcerated and who requires assistance in meeting the child's developmental needs.
- has no parent or guardian.
- is drug-exposed.

(F.S., 411.201-205)

For More Information

To obtain a copy of Florida's Handicap Prevention Report or further information contact:

B.C. Parker
Program Specialist - Infants and Toddlers
Office of Early Intervention
Department of Education
Tallahassee, Florida 32399-0400
(904) 488-6830
SunCom: 278-6830

Diane Lincoln
Prevention Coordinator
Office of Program Policy Development
Department of Health and Rehabilitative Services
1317 Winewood Boulevard
Tallahassee, Florida 32399-0700
(904) 488-2761
SunCom: 278-2761

LEGAL ISSUES

The following is excerpted from a paper entitled "Drug Addiction, AIDS and Childbirth: Legal Issues for the Medical and Social Services Communities". The paper points to the difficulty in balancing the rights of the pregnant woman, the unborn child, and society at large. The authors emphasize the role of the medical community in the prevention of substance abuse during pregnancy, and in early intervention with affected children:

> Clearly, there are many new legal issues emerging as a consequence both of the large number of women who abuse drugs through pregnancy and of the AIDS epidemic. [This paper's] purpose is to focus attention on the conflicting interests and rights involved and to offer some concrete ideas as to how these interests might be balanced.
>
> In sum, although the state courts have granted unborn children some rights in other contexts, any attempt to grant unborn children greater protection against actions taken by their mothers during pregnancy will be subject to strict scrutiny. Only very narrowly tailored restrictions on maternal conduct with the minimum intrusion necessary will have any chance of surviving constitutional challenge...Moreover, before any legal action is taken, the medical community must consider whether state intervention will really serve the purpose for which it would be designed or whether it would simply deter pregnant women from seeking any prenatal care. Attention must also be given to

ensuring that there are adequate drug and alcohol treatment centers before any mandatory treatment is initiated.

In the meantime, states should move ahead to strengthen child abuse and neglect reporting requirements and to extend them to infants born drug dependent. Sanctions for willful failure to diagnose and report drug dependency among newborns should be considered. At the same time, greater protections must be given to the mandatory reporters to ensure that they will be willing to provide all of the information needed by state agencies to act on the reports received.

The medical community should take greater steps to advise women of the consequences of actions taken during pregnancy. Brochures should be developed to give to all women who come in for prenatal care which describe the consequences of continued drug and alcohol use during pregnancy. If a woman cannot read the brochure, someone should read it to her. By informing the woman of the consequences of her conduct, the physician will be limiting his or her liability.

Physicians and hospitals must also develop protocols for obtaining informed consent of a parent or legal guardian before drug tests are run on newborns and for reporting cases of infants born drug dependent.

Source: Walter B. Connolly, Jr. and Alison B. Marshall
Miller, Canfield, Paddock and Stone
2500 Commerce Building
Detroit, Michigan 48226
(313) 963-6420

Chapter 6

WHAT RESOURCES ARE AVAILABLE TO AID THE HELPING PROFESSIONAL?

- Hotlines
- Sources for Information, Consultation and Training
- Selected Bibliography

Chapter 6
WHAT RESOURCES ARE AVAILABLE TO AID THE HELPING PROFESSIONAL?

HOTLINES

Cocaine Baby Help Line, 1-800-327-BABE, in Indiana, Michigan, Minnesota, Missouri, Wisconsin, Kentucky. Outside these states, call (312) 908-0867.

1-800-COCAINE, 24-hour toll-free information and referral service.

SOURCES FOR INFORMATION, CONSULTATION, AND TRAINING

AIDS Project, Prevention Center, Office of Policy Research and Improvement (OPRI), Florida Department of Education, 414 Florida Education Center, Tallahassee, FL 32399-0444, (904) 488-7835, SunCom 278-7835. Contact: Mae Waters, Director, AIDS Project.

Alcohol and Drug Abuse Program, State of Florida Department of Health and Rehabilitative Services (HRS), 1317 Winewood Boulevard, Tallahassee, FL 32399-0700, (904) 488-0900, SunCom 278-0900. Contact: Terri Goens, Senior Human Services Program Specialist.

Arnold Palmer Hospital for Children and Women, 92 West Miller St., Orlando, FL 32806, (407) 841-5111 ext. 6029. Contact: Dr. Frank A. Lopez, Assistant Director of Medical Education, and Specialist in Development, or Dr. Robert L. Maniello, Co-Director of Newborn Nursery, and Director of Ambulatory Pediatrics.

Children's Home Society of Florida, 370 Office Plaza, Tallahassee, FL 32301, (904) 877-5176. Contact: John Haynes, Director.

Department of Health and Rehabilitative Services (HRS), State Health Office, Family Health Services, 1317 Winewood Blvd., Tallahassee, FL 32399-0700, (904) 487-1321. Contact: Donna Barber, Director.

Drug-Exposed Children's Committee, Hillsborough County Schools, 411 E. Henderson Ave., Tampa, FL 33602, (813) 272-4577, SunCom 547-4577. Contact: Linda Delapenha, Supervisor, Diagnostic Services, Hillsborough County Schools.

Drug-Free Schools Program, Prevention Center (OPRI), Florida Dept. of Education, 414 Florida Education Center, Tallahassee, FL 32399-0444, (904) 487-8771, SunCom 278-8771. Contact: Nancy Fontaine, Director, Drug-Free Schools Program.

The Family Center, Thomas Jefferson University Hospital, 11th and Chestnut Streets, Suite 6105, Philadelphia, PA 19107, (215) 928-8850. Contact: Terry Hagen.

Far West Laboratory for Educational Research and Development, Drug-Free Pregnancy Project , 180 Harbor Drive, Suite 112, Sausalito, CA 94965, (415) 331-5277. Contact: Diana Kronstadt.

Florida Alcohol and Drug Abuse Association, 1286 North Paul Russell Road, Tallahassee, FL 32301, (904) 878-2196. Contact: Cindy Colvin.

Interdisciplinary Training for Professionals Serving Chemically Dependent Families, UCLA Department of Pediatrics, 23-10 Rehabilitation Center, 1000 Veteran Avenue, Los Angeles, CA 90024-1797, (213) 825-4622. Dr. Judy Howard, Principal Investigator. Contact: Vicki Kropenske, Project Director.

Juvenile Welfare Board of Pinellas County, 4140 49th St. N., St. Petersburg, FL 33709, (813) 521-1853. Contact: Kate Howze, Community Relations Specialist.

March of Dimes Birth Defects Foundation, Community Services Department, 1275 Mamaroneck Avenue, White Plains, NY 10605, (914) 428-7100. See also local chapters.

National Association for Perinatal Addiction Research and Education (NAPARE), 11 E. Hubbard St. Suite 200, Chicago, IL 60611, (312) 329-2512. Contact: Eileen Ward (for scheduling) or Pat O'Keefe (public information).

National Clearinghouse for Alcohol and Drug Information, Post Office Box 2345, Rockville, MD 20852, (301) 468-2600.

Salvin Education Center, 1925 S. Budlong Avenue, Los Angeles, CA 90007, (213) 731-0703. Contact: Gayle Sadofsky, Principal.

Snowbabies, Inc. P.O. Box 162856, Altamonte Springs, FL 32716-2856, (407) 331-5577.

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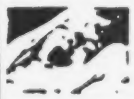
APPENDIX A:
SELECTED RESEARCH ARTICLES

A First: National Hospital Incidence Survey

NAPARE
National Association for Perinatal Addiction Research and Education
11 E. Hubbard St., Suite 200
Chicago, IL 60611
(312) 329-2512



Substance abuse in pregnancy is one of the most commonly missed of all obstetric and neonatal diagnoses, according to the first national hospital incidence survey conducted by National Association for Perinatal Addiction Research and Education (NAPARE). As many as 375,000 infants may be affected each year, said Ira J. Chasnoff, M.D., President of NAPARE.

In a keynote address to a national training conference on drugs, alcohol, pregnancy and parenting which was held in New York City August 28 to 31, Chasnoff said, "Many of these cases are unrecognized until after birth when the baby is born addicted, often with severe physical or neurological damage." This lack of recognition, he said, accounts for the high rate of infant morbidity and mortality in these infants.

Major Conclusions:

1. The high rate of pregnancies or births in which drugs are present is not confined to the largest urban areas; the rate is similar in hospitals across the country.
2. The high rate is not confined to hospitals with high rates of low income or public aid patients. Hospitals with small or moderate rates of public aid patients reported an incidence of substance abuse similar to hospitals with greater than half their patients on public aid.
3. The incidence reported by each hospital correlates with the thoroughness with which the hospital staff screens and/or tests pregnant women patients.

Included in the study, which was funded by grants from the Office for Substance Abuse Prevention (OSAP) and the March of Dimes Birth Defects Foundation, were 36 hospitals from across the country, accounting for 154,856 births. The responses were supplied by the chairman of obstetrics, pediatrics, neonatology, or maternal-fetal medicine in each hospital.

"Initially, we found the overall incidence of diagnosis of substance abuse in the 36 hospitals was 11 percent with a range of 0.4 percent to 27 per cent," Chasnoff said. "To find the reason for this wide variation, we examined the results in relation to the proportion of public aid patients. We found the rates were similar in all the hospitals, so this did not explain the differences." (See Table 1)

The researchers then categorized the hospitals according to the thoroughness of the substance abuse assessments conducted during prenatal or perinatal period. The hospitals were divided into three groups: those at which no assessment by history or urine toxicology was conducted during or after pregnancy; those that had a policy that all pregnant women would be questioned about substance abuse, but did not have an established protocol and did not monitor compliance; and hospitals that had a protocol for assessing every pregnant woman and/or newborn for substance abuse or exposure. (See Table 2)

Chasnoff said, "In this phase of the study, we found that the incidence in hospitals with established protocols and monitoring was three to five times greater than in the two groups of hospitals with no monitoring or incomplete monitoring. The number of public aid patients was not a factor."

The substances included in the survey were heroin, methadone, cocaine, amphetamines, PCP, and marijuana.

The results of the study, Chasnoff said, mean there is an urgent need for physicians, nurses, social workers, and other health care professionals to establish protocols for early recognition of the substance abusing woman and for providing treatment and intervention programs for both mothers and their children.

He pointed out that if one or more children in every ten born are affected by their mothers' substance abuse during pregnancy, the impact on health care, social services, and public education would be dramatic and costly.

Among the 36 hospitals, nine had conducted formal studies of the incidence of illicit drug use in pregnancy. (See Table 3)

Hospitals Interviewed for NAPARE Incidence Survey

Allegheny General Hospital, Pittsburgh, PA
Beth Israel Medical Center, New York, NY
Boston City Hospital, Boston, MA
Chicago Osteopathic Hospital, Chicago, IL
Christiana Hospital, Newark, DE
Emmanuel Hospital, Portland, OR
Episcopal Hospital, Philadelphia, PA
Evanston Hospital, Evanston, IL
Harlem Hospital, New York, NY
Jackson Memorial Hospital, Miami, FL
Jeff Davis Hospital, Houston, TX
Jewish Hospital, St. Louis, MO
Johns Hopkins Hospital, Baltimore, MD
Kings County Hospital, Brooklyn, NY
Martin Luther King Hospital, Los Angeles, CA
Mercy Hospital, Rockville Center, NY
Merrithew Memorial Hospital, Martinez, CA
Northwestern Memorial Hospital, Chicago, IL
Oklahoma Health Center, Oklahoma City, OK
Oregon Health Sciences University Hospital, Portland, OR
Parkland, Hospital, Dallas, TX
Pennsylvania Hospital, Philadelphia, PA
Regional Medical Center, Memphis, TN
Rush/Presbyterian/St. Luke's Hospital, Chicago, IL
St. Elizabeth's Hospital, Boston, MA
St. Francis Hospital, Pittsburgh, PA
St. Luke's/Roosevelt Hospital Center, New York, NY
St. Margaret's Hospital for Women, Boston, MA
San Francisco General, San Francisco, CA
Shands Hospital, Gainesville, FL
Stanford University Hospital, Stanford, CA
Thomas Jefferson University Hospital, Philadelphia, PA
Toledo Hospital, Toledo, OH
University of California Davis Hospital, Sacramento, CA
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The study was supported by grants from the Office for Substance Abuse Prevention (OSAP) and the March of Dimes Birth Defects Foundation.

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Infants exposed to cocaine in utero: Implications for developmental assessment and intervention

Findings of developmental assessment in the newborn and early infancy periods are presented. The implications of abnormal state control and orientation as well as dysfunction in motor control are discussed as the basis for intervention. Intervention in the newborn phase includes information on positioning, handling, and feeding. Parent education to improve the infants' ability to interact with caregivers is emphasized. Improving the infants' movement patterns through play, carrying positions, and handling techniques is the focus of intervention in infancy. While intervention with cocaine-exposed infants is presently possible, these children should be followed by health care professionals through preschool and early school years to identify any behavior or learning disorders that may be associated with intrauterine cocaine exposure.

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DRUG ABUSE in the United States is beginning to be recognized and acknowledged as a significant societal problem. The use of cocaine and its derivatives occurs in all segments of US society regardless of race, ethnicity, or socioeconomic status. Furthermore, cocaine use during pregnancy is no longer an unusual phenomenon. In fact, it appears to be increasing.[1-3] A recent study by the National Association for Perinatal Addiction Research and Education[4] surveyed 36 hospitals around the country and found that at least 11% of women in the hospitals studied had used illegal drugs during pregnancy. Based on those figures, an estimated 375,000 newborns per year face health hazards from their mothers' prenatal drug abuse.

Specific hazards of prenatal cocaine use include increased rates of spontaneous abortion, abruptio placentae, intrauterine growth retardation, and in-utero cerebrovascular accidents. Attempting to determine the impact of prenatal cocaine exposure on development, however, is a complex issue. Many women whose drug of choice is cocaine are abusers of other drugs as well. It is often difficult to ascertain the frequency and amount of drug use. It is also acknowledged that the infant's environment as well as prenatal exposure to drugs will have a profound effect on subsequent development. Currently, data from both a research and an empirical

The research on which this article is based was supported by a grant from the National Institute on Drug Abuse, National Institutes of Health (DA04-103-01).

Inf Young Children, 1989, 2(1), 25-36
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perspective are being gathered to help clarify the effects of prenatal cocaine exposure.

American society has begun to more readily acknowledge drug abuse. Health care professionals can now begin to gather information concerning development following prenatal drug exposure, and at the same time begin appropriate intervention on behalf of exposed infants. This article describes motor development of cocaine-exposed infants, the impact on other areas of development during the newborn and early infancy stages, and intervention strategies appropriate for cocaine-exposed infants and their caregivers.

COCAINE: PROPOSED MECHANISMS OF ACTION IN UTERO

The placenta does not protect the fetus from cocaine exposure. Cocaine readily crosses from maternal to fetal circulation and may remain in the infant's system long after it has been excreted by the mother because immature liver and kidneys metabolize the cocaine more slowly. As cocaine is metabolized, it is broken down into norcocaine, a highly active metabolite with a high level of penetration into the central nervous system (CNS). Because norcocaine is water soluable, it does not readily pass back into the mother's system for excretion. It is theorized that an infant may continue to be exposed to cocaine and its active metabolites by reingestion of norcocaine through the amniotic fluid.[3]

Cocaine acts centrally on the CNS as a stimulant while peripherally causing vasoconstriction, tachycardia, and a rapid rise in blood pressure.[6-8] These physiologic effects are thought to occur in both mother and fetus, and therefore may explain increased rates of spontaneous abortion, abruptio placentae, and in-utero cerebrovascular accidents associated with cocaine use during pregnancy.[1,2,9,10] Documentation of specific CNS damage has been reported by Dixon and Bejar[11] on a sample of 28 cocaine-exposed infants. They found that 39% of that sample showed hemorrhagic cerebral infarcts documented by cranial ultrasound at birth. While the physiologic effects of cocaine on the adult have been well documented,[12] research is only now showing that the same and perhaps more severe effects may be experienced by infants exposed to cocaine in utero.

DESCRIPTION OF THE COCAINE-EXPOSED INFANT

As health care professionals encounter more newborn infants exposed to drugs prenatally, the initial task is to identify drug-exposed infants. Withdrawal syndromes are well-documented in infants born to heroin-addicted mothers; however, some controversy exists concerning the presence of a cocaine withdrawal syndrome.[13] Whenever prenatal exposure to drugs is suspected, urine toxicology screens of both mother and infant should be performed. Common clinical signs of prenatal cocaine exposure include hyperirritability, poor feeding patterns, high respiratory and heart rates, increased tremulousness and startles, and irregular sleeping patterns.[13] Relating these signs to a withdrawal syndrome may be a misnomer, since the infant may in fact still be experiencing the direct effects of cocaine exposure. Also, because some of these effects persist beyond the first few weeks of life, they may be indications of a more lasting CNS change rather than a withdrawal pattern.

Full-term cocaine-exposed infants have been tested as newborns and at one month of age using the Brazelton Neonatal Behavioral Assessment Scale.[14] Infants at both ages show depressed interactive abilities and poor state control when compared to drug-free infants of the same ages.[2,15,16] While these behavioral characteristics are not unique to cocaine-exposed infants, they have been noted as part of the cluster of characteristics that describe a large percentage of these infants.

Beyond the newborn period, the Movement Assessment of Infants (MAI)[17] has been used to assess motor development of full-term cocaine-exposed infants at four months of age. This test was chosen since it provides both a quantitative and a qualitative assessment of motor development in the

first year of life. Ongoing results of research suggest that many symptoms noted on the Brazelton examination in the newborn cocaine-exposed infant remain at four months of age on the MAI.[18,19] For example, frequent tremors, especially in the upper extremities, are still noted at four months of age. These infants display increased extensor muscle tone, especially in the lower extremities. Primitive reflexes normally integrated by four months are often still present. Using previously established risk categories, approximately 40% of the cocaine-exposed infants studied were designated "high risk" for motor developmental dysfunction as opposed to 2% of a control group (JW Schneider and IJ Chasnoff, unpublished data, 1989). This means that cocaine-exposed infants were approximately 40 times more likely to be designated "high risk" for motor developmental dysfunction than nonexposed infants.[18,19]

Preliminary results of eight-month-old cocaine-exposed *v* nonexposed infants suggest that while motor abnormalities have lessened by this age, they have not totally disappeared. Some of the cocaine-exposed eight-month-old infants, while able to crawl, were slow in moving, and stood bearing weight on their toes with stiff extension of their lower extremities. Future studies are needed to document motor development of cocaine-exposed infants in the first year of life and beyond.

DEVELOPMENTAL IMPLICATIONS OF COCAINE EXPOSURE

State control

The physiologic effects of cocaine on the newborn nervous system make state control difficult. Newborns have a variety of behavior states available to them and cycle through periods of sleeping (deep or light sleep), wakefulness (drowsy, quiet alert, active alert), and crying.[14] It is expected that newborns will spend some time in each of these behavioral states, that they will move smoothly from state to state, and that as they grow they will spend more time in quiet alert states and less time sleeping or crying. Many cocaine-exposed infants, however, do not show organized behavior states or smooth state changes, but rather tend to change rapidly from one extreme state (eg, deep sleep) to another (eg, frantic crying).

Four common behavioral patterns have been observed clinically in newborn cocaine-exposed infants.[15,16] Some infants, in response to any sort of stimulation, will pull themselves down into a deep sleep. These infants will not awaken in response to handling of any sort. While this is a protective mechanism for their fragile nervous system, it precludes any caregiver-infant interaction.

A second pattern presents as an agitated sleep state. These infants seem stressed by external stimulation (as evidenced by startling, color changes, whimpering) but do not wake up to attend to the stimulation.

Newborn cocaine-exposed infants demonstrate a third behavioral pattern by vacillating between extremes of state (sleeping or crying) during handling.[15,16] For example, when unwrapped from a blanket they immediately cry and show agitation, but when wrapped up again, they quickly fall asleep.

The fourth common behavioral pattern resembles a panicked awake state.[15,16] This is seen in an infant who can achieve an alert state for short periods but appears quite stressed while doing so and requires a lot of help from the caregiver to stay calm.

The descriptions of these four behavioral states make it clear that many newborn cocaine-exposed infants may be initially incapable of responding appropriately to their caregivers. Because they have such difficulty reaching and maintaining an alert state, their abilities to attend to either auditory or visual stimuli may be quite limited. Those cocaine-exposed infants who do reach alert states usually need outside assistance to stay calm, and then only attend to a stimulus briefly before showing signs of distress such as gaze aversion, increased respirations, or disorganized motor activity.[15,16]

The reciprocity normally present in the process of bonding may be very difficult for these infants.[20,21] Thus if inadequate behavioral interaction between

infant and mother results, it places their relationship at risk, since studies have shown that the behavior of the newborn affects the caregiving he or she receives.[22,23] In effect, a negative cycle may be set up in which the behavior of the poorly organized, high-risk infant may suppress the optimal caregiving pattern necessary to facilitate his or her recovery.[24,25] The feelings of frustration and inadequacy that parents may experience in dealing with their fragile yet unresponsive infants may predispose them later to physical child abuse, as has been seen in other high-risk infant groups.[26]

Motor behavior

Looking beyond the newborn period to the age of four months, it is important to remember some of the key characteristics of normal four-month-old motor behavior. When supine, four-month-olds are very active. They can reach out easily to midline and finger one hand with the other. The infants' lower extremities are also very active. They can flex and extend their legs and kick reciprocally. The infants flex their legs in order to begin playing with and exploring their knees and feet. This is an important part of learning and contributes to the proper development of body image. Flexibility is a key descriptor of four-month-old motor development. They are developing control of both the flexor and extensor muscle groups without being dominated by either one. Even though a four-month-old cannot stand independently, when held in supported standing this flexibility is seen by a relaxed standing posture that incorporates both flexor and extensor muscle control.

The flexibility so evident in normal four-month-old motor behavior is often less apparent in some cocaine-exposed infants. When supine, these infants often lie in excessively extended postures, and movements of their extremities may be jerky and stiff.[18,19] While they do reach out for objects, the presence of tremors in the upper extremities may have an impact on their development of good eye-hand coordination. Many cocaine-exposed infants are less able to round their buttocks off the supporting surface or kick reciprocally.[18,19] This stiffness in their lower extremities prevents them from exploring their lower body either visually or with their hands. Visual and tactile exploration of body parts are important in the development of body image and contribute to the ability to move well in the environment (ie, motor planning).

The increased extensor muscle tone noted in the supine position is noted in other positions as well. Many cocaine-exposed infants display an exaggerated positive support reaction when held in an upright position.[18,19] This reaction is characterized by stiff extension of hips, knees, and ankles and weight bearing on the toes. This type of standing posture encourages abnormal alignment of the body parts and would impede development of appropriate balance control.

The above descriptions of the motor abilities of some cocaine-exposed infants suggest that they are mildly hypertonic infants with dystonic movement patterns. It is important that health care professionals be able to identify these characteristics in the cocaine-exposed infant and understand the effect of any detected behavioral or motor abnormalities on later development. Health care professionals can also provide appropriate intervention to mother and infant both before and after birth.

INTERVENTION

Intervention will be addressed by considering the infant's developmental phases from before birth through infancy. Within each phase, the focus is on enhancing infant development, and intervention with parents will be addressed from this viewpoint.

Prenatal program

Drug abuse programs now exist in most major cities across the country. Programs for the pregnant addict, however, are less prevalent. As awareness of the problem increases, programs such as the Perinatal Center for Chemical Dependence (PCCD) at Northwestern University Medical School in Chicago, Illinois, should become more available to drug-abusing pregnant women.

The PCCD is a comprehensive program staffed by a number of medical personnel, including physicians, nurses, a developmental psychologist, a physical therapist, a social worker, and drug dependency counselors. The PCCD provides prenatal and postnatal addictive care, obstetric care, and psychological care, as well as pediatric care for the infant. There is a heavy emphasis on education throughout the program, including topics such as Lamaze training, family planning, nutrition, having a healthy baby, parenting, infant-toddler series, a woman's issues and the law. It is hoped that programs such as this will provide more information about the effects of drug exposure on infant development while providing comprehensive care for those who seek it.

Newborn phase

The therapeutic techniques described below were chosen to address the specific needs of the cocaine-exposed infant.[27] These same techniques would be equally appropriate for any infant who displays similar clinical manifestations. The overall intervention goals of this period are to increase periods of alertness so that appropriate infant-caregiver interactions can occur. This broad goal can be accomplished by meeting each of the subgoals listed in Table 1.

Positioning

Even in the newborn nursery, cocaine-exposed infants can be positioned to improve their posture and movement patterns. The infant can be positioned on his or her side to overcome both increased extensor tone and the effects of gravity. The spine, including the head, should be flexed, bringing the infant away from the hyperextended position (Fig 1).[28] Upper extremities should be protracted at the shoulder girdle to encourage midline orientation. Lower extremities should be flexed somewhat to break up pelvic and lower extremity extensor tone. Rolled-up cloth diapers can be placed between the legs and along the spine to support and maintain the posture while allowing the infant freedom to move within the posture. Covering the infant with a blanket tucked in on each side of the mattress will help maintain this relaxed posture and thus encourage a more relaxed behavioral state.

Handling

A caregiver's first impulse might be not to handle the cocaine-exposed infant for fear of setting off an irritable response from the hypersensitive infant. However, proper handling is essential to help the infant improve state control and appropriate motor patterns. Initially an infant may need to be swaddled in a blanket in a semiflexed position. The warmth from the blanket appears to cause inhibition of motor behavior.[29] In addition, the flexed position breaks up the extensor tone, decreases tremors and overshooting, and facilitates normal hand-to-mouth activity. In conjunction with swaddling, slow rocking may be necessary to calm the infant. Studies have shown that such vestibular proprioceptive stimulation frequently has the immediate effect of arresting crying, reducing irritability, and bringing the infant to a visually alert state.[30] This produces a sense of effectiveness in the caregiver that encourages social interaction.

While vestibular-proprioceptive input appears to have a strong effect on the infant's motor control, other forms of slow rhythmical input (eg, visual, auditory, tactile) could be used to "pacify" the infant.[31] Once the infant has become calm, he or she can be held in the en face (face-to-face) position to encourage visual tracking, vocalization, and playful interaction with the caregiver (Fig 2). Initially, this face-to-face interaction may be brief, since cocaine-exposed infants often have difficulty processing complex combinations of stimuli such as looking at the mother's face and listening to her voice at the same time. The infant may signal this sensory overload by crying or averting his or her gaze.

Another unique form of handling the cocaine-exposed infant to reduce irritability and improve motor control is the use of neonatal hydrotherapy. This consists of placing the infant in a small tub or bassinette filled with water 99°F to 101°F. Hydro-

Table 1. Summary of intervention goals and management related to period of development

Period of development	Intervention goals	Management
Newborn	Increase periods of alertness and interaction	
	Prevent hyperextended posture	Positioning in sidelying
	Decrease irritability, tremors, and overshooting	Swaddling and rocking
		Hydrotherapy graded auditory and visual stimuli
	Improve feeding patterns	Positioning and handling
	Improve feeding posture	
	Decrease facial and oral hypersensitivity	Tactile stimulation to facial and oral areas
	Improve parent handling	Observe Brazelton Model for appropriate behavior
		Demonstration and return demonstration of appropriate handling
Infancy	Improve movement patterns to enhance interaction and exploration	
	Decrease extensor tone	Supine flexion with lower extremity rotation
		Prevent extensor thrusting in sitting and standing
		Discourage supported standing
		Discourage use of jumpers and walkers
		Carry inflexed position
		Slow, gentle movement through space
	Increase antigravity strength	Prone positioning
		Pivoting in prone position
		Sitting with support for short periods
	Improve parent handling	Demonstrations and return demonstrations of appropriate play and carrying positions and handling techniques

therapy techniques include handling to facilitate head in midline, hand-to-mouth activity, and flexion and rotation of the trunk. An overhead radiant heater should be used to decrease temperature loss during hydrotherapy. Vital signs should be carefully monitored for any signs of physiologic instability. Sweeney[27,32] has used hydrotherapy in an intensive care nursery setting and has found it to be effective in improving posture, muscle tone, behavioral state, and feeding behavior in premature infants. These outcomes are also appropriate for cocaine-exposed infants. If the infant responds well to this form of state control, it could easily be taught to the parents and adapted for home use.

While swaddling, rocking, and other methods of calming may initially be necessary, it is important to

Fig 1. Infant in flexed sidelying position used to decrease extensor tone. Reprinted from Schneider JW, Chasnoff IJ: Cocaine abuse during pregnancy: Its affects on infant motor development—A clinical perspective. *Top Acute Care Trauma Rehabil* 1987;2(1):63.

use these methods only as needed and to begin to withdraw these additional techniques as soon as possible so that the infant learns to gain control over his or her state. For example, swaddling may initially be necessary every time the infant is handled. As the infant responds more to calming measures and begins to show self-calming abilities, swaddling should only be done when the infant seems unable to respond without this intervention.

Fig 2. Swaddled infant in en face position with mother. Reprinted from Schneider JW, Chasnoff IJ: Cocaine abuse during pregnancy: Its affects on infant motor development—A clinical perspective. *Top Acute Care Trauma Rehabil* 1987;2(1):64.

Feeding

Poor feeding has been mentioned as a symptom in cocaine-exposed newborns.[13] Problems in oral motor control are again most probably related to abnormal extensor tone, disorganized movement patterns, and poor state control. Proper positioning and handling techniques described above should prepare the infant motorically and behaviorally to assume and maintain a more relaxed, flexed posture during feeding. Cocaine-exposed infants may also display oral hypersensitivity. Gentle but firm tactile stimulation around the face as well as within the mouth should help to decrease sensitivity and increase appropriate sucking behavior.

Parent education

This component of the intervention program is of paramount importance in enhancing normal infant development as well as ensuring a strong parent-infant bond. Parent education should begin early enough so that parents can learn appropriate and effective caregiving and avoid compounding the problems of the already at-risk infant. Having the parents observe the Brazelton Neonatal Behavioral Assessment appears to have a positive effect on later interaction with their infants.[33] This is probably because parents are able to see the positive characteristics and the strengths their infant possesses rather than focusing only on the weaknesses. While it appears that some drug-abusing mothers continue to deny their infant's problems, pointing out positive attributes as well as ameliorating

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problem behaviors will serve to strengthen the mother's bond with her infant.

Many cocaine-abusing mothers may not be physically or psychologically ready to observe the initial assessment done on their infants a few days after birth.[16] Information gained during this assessment, however, can be used to educate the mother about the competencies and needs of her infant. Most important to understand is how easily the cocaine-exposed infant can become overstimulated. Parents are taught to recognize common distress signs from overstimulation such as yawning, sneezing, hiccuping, gaze aversion, spitting up, color changes, and crying.[15]

When the infant is alert, they are instructed to try to engage the infant en face without speaking or moving too quickly. If the infant is fixing on them comfortably, they may try either speaking to the infant in a soft rhythmic voice or moving slowly in front of the infant without speaking. For some infants, any direct visual input may prove too stressful initially. In this case, parents are instructed to hold the infant in a vertical position against their chest with the infant facing away from the parent (Fig 3).[15] In this position, the infant may be held securely to prevent uncontrolled movements and can hear the parent's voice without needing to interact visually.

Whenever an infant does become distressed, parents are encouraged to see this as an attempt of the infant to ask for help and are taught the calming techniques (swaddling, pacifier, vertical rocking) discussed earlier. Repeated demonstrations of positioning and handling techniques to relax and begin interacting with the infant, as well as return demonstration by the parents, are all part of the educational process.

More than teaching dos and don'ts, parents are taught to pay attention to their infant's cues during interactions and to respond as quickly as possible. Modeling of appropriate handling and feedback to parents on their handling and interactions help the parents to expand the infant's range of appropriate behaviors. Regardless of how competent a parent may seem, a follow-up session after the infant has been in the home setting for at least one week is recommended. Follow-up visits at one week and one month of age allow the infant's improvements in state control to be highlighted for the parents. Suggestions for appropriate progression of interactions with the infant to increase his or her responsiveness to more complex stimuli for long time periods are also given. These sequential intervention sessions help determine how appropriate the parent-infant interactions appear and how well the infant has fit into the family unit.

Fig 3. Infant held securely facing away from parent.

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Infancy

The goal of intervention during this period is to have the infant move appropriately throughout his or her environment. By moving well, he or she will be able to interact well and explore his or her environment appropriately. Thus, infant motor abilities can have an impact on psychosocial and cognitive development. Since cocaine-exposed infants beyond the newborn period demonstrate increased muscle tone and retention of primitive reflexes, they may require intervention to move normally. This intervention can be in the form of practical suggestions for appropriate play and carrying positions or ways to handle infants to decrease muscle tone while encouraging normal movement.[80]

Play positions

When supine, cocaine-exposed infants show increased extensor tone. This tone causes decreased pelvic mobility and limits the infant's ability to lift the legs up to play with his or her knees or to kick reciprocally. Parents can be taught to lift the infant's pelvis up and flex the legs toward the chest, enabling the infant to overcome the extensor tone and to begin increased kicking movements with the lower extremities (see Table 1). From this position of supine flexion, the lower extremities can be rotated from side to side to further decrease extensor tone (Fig 4). The upper extremities may need to be brought down and forward (depressed and protracted) at the shoulder girdle to allow the arms to reach out to grasp objects. Parents should be warned against leaving their infants supine for long periods, since increased extensor tone and the effects of gravity make movement difficult in this position.

Prone is a good position for infants to develop antigravity extensor strength. Because cocaine-exposed infants have a preponderance of extensor tone, they usually enjoy this position and perform well in it. The infants should be encouraged to move in prone by placing colorful stimulating toys beside them, which prompts pivoting in the trunk to reach the toys.

Fig 4. Lower extremity rotation in supine flexion position. Reprinted from Schneider JW, Chasnoff IJ: Cocaine abuse during pregnancy: Its affects on infant motor development—A clinical perspective. *Top Acute Care Trauma Rehabil* 1987;2(1):66.

Sitting is an appropriate developmental activity from approximately five months of age, and, in addition, infants may sit with the support of their parents from birth onward. One caution to parents is not to place infants in the sitting position for long periods of time, since newly developing trunk extensor muscles will not be capable of sustaining the erect position. In addition, cocaine-exposed infants often push backwards into extension when sitting (or standing). This extensor thrusting should be prevented by bending the infant forward at the hips whenever thrusting occurs or is anticipated. If thrusting is allowed to continue, extensor tone (already abnormally high) will be further facilitated.

Supported standing allows infants to experience upright weight bearing throughout the lower extremities. Cocaine-exposed infants characteristically enjoy standing because it allows them to use their abundance of extensor tone. They can frequently be observed in rigid stand positions, including going up on their toes or thrusting head and trunk backward into extension. Despite their obvious

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enjoyment of standing, this position should not be encouraged since it reinforces their abnormal tone and movement patterns.

Use of infant assistive devices such as jumpers and walkers should be discouraged. Parents should be informed that thousands of injuries each year are related to the use of these devices.[54] As importantly, infants placed in these devices are not exercising their muscles appropriately, since they do not yet have the ability to hold themselves in proper postural alignment when placed in the upright position.[55] The leg actions of an infant in a walker have little relationship to walking skills. Rather than training an infant to walk, the walker may actually impede progress by inhibiting the infant from crawling around.[55] Walkers encourage hypertonic infants (like the cocaine-exposed infants) to further increase their extensor tone by pushing their feet against the floor and arching their trunks backwards.[55,56]

Fig 5. Infant in flexed carrying position. Reprinted from Schneider JW, Chasnoff IJ: Cocaine abuse during pregnancy. Its affects on infant motor development—A clinical perspective. *Top Acute Care Trauma Rehabil* 1987;2(1):67.

Carrying

Since cocaine-exposed infants display primarily extensor tone, they should be carried in a more flexed position to counteract this. Fig 5 illustrates how the infant sits on the parent's hip while being supported by the parent's arm under the infant's thighs. The infant's arms are kept forward, which facilitates the hands coming to midline. This position controls the infant's tone while facilitating head and trunk control and the ability to reach and grasp objects.

Handling

Parents who have been taught to handle their infant so as to optimize interaction in the newborn period can now expand on those abilities as their infant grows and changes. The cocaine-exposed infant should no longer require swaddling to stay calm; he or she may, however, require more sensitive handling than normally required of a growing infant. For example, while rough-house play is enjoyed by most infants, cocaine-exposed infants may be more sensitive to quick rough movements and may respond by stiffening their bodies or crying. Slow, gentle swinging through the air should replace rapid movements in space during rough-house play. In all cases, the infant's reactions (physically and behaviorally) should guide parents in assessing the appropriateness of their handling.

Parent education, which includes appropriate play, carrying, and handling techniques, changes according to the infant's needs. While many cocaine-exposed infants may not require intensive physical therapy, monthly sessions may be necessary to demonstrate developmentally appropriate activities and to teach parents new handling skills. As always, return demonstrations from parents are important to confirm their level of skill and understanding.

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It is clear from present research findings that cocaine exposure in utero is not an innocuous phenomenon. Physical and behavioral findings exist that are worrisome to the pediatric health care professional. Clinical experience has shown that some of these findings can be ameliorated with appropriate intervention.

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Because of the tremendous potential for plasticity that exists within the human nervous system, it may be expected that hard neurological signs and gross motor dysfunction may not be apparent after 12 months of age. However, the early effects of cocaine on the developing nervous system may place the drug-exposed infant at high risk for minimal brain dysfunction, which involves an abnormal nervous system reorganization that may result in behavior and learning difficulties.[57-60]

Studies are needed to document motor development of cocaine-exposed infants later in the first year of life. Follow-up of these infants through preschool and early school years will help to identify any behavior or learning disorders that may be associated with intrauterine cocaine exposure.

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Zero to Three

Bulletin of
NATIONAL CENTER FOR CLINICAL INFANT PROGRAMS VOL. IX. NO. 5, JUNE 1989 ISSN 0736-8046

Drug Exposed Babies: Research and Clinical Issues

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JOHN DAVID ARMS

Specialists in drug treatment know well the pervasive destructive effects of drug addiction or drug abuse on an individual's capacities to function in daily life. In recent years, however, the drug abuse problem has developed a new face—the face of a baby. Drug-exposed infants are a large and still growing population requiring treatment in newborn nurseries, neonatal intensive care units, and early intervention programs. The increasing prevalence of drug use or addiction among women of childbearing age is redefining the drug treatment problem, bringing new challenges and complexities to professionals working with infants, children and families. Changes in prevalence are due in large part to increasing use of cocaine with its very high addictive potential. We can no longer view drug abuse or drug addiction as problems of individuals; these are problems with a devastating impact on infants, children and families.

Four facets of babies' exposure to drugs deserve special mention.

First is the sheer increase in the numbers of babies born in the United States who have been exposed to drugs in utero (U.S. House of Representatives, May, 1988). A recent nationwide hospital survey conducted by the National Association for Perinatal Addiction Research and Education (NAPARE) found that the overall rate of deliveries affected by substance abuse

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newborns affected annually (ADAMHA News, October, 1988), with the variation in rates among hospitals (0.4 percent to 27 percent) related chiefly to the thoroughness of the substance abuse *assessment* used. The problem of substance abuse during pregnancy does not seem to be confined to urban settings, nor is it limited to low income women. A 1989 survey conducted by the Select Committee on Children, Youth and Families (see p. 20) found 15 of 18 hospitals reporting 3 to 4 times as many drug exposed births since 1985.

Second, HIV (human immunodeficiency virus) infection in young children is inextricably linked to drug use in adults. Of all HIV-infected children under 13 years of age in the United States, about 80% have a parent with AIDS or AIDS Related Complex or who is at risk for AIDS. (Falloon, Eddy, Warner and Pizzo, 1989) Little is known about the timing of mother-to-child transmission, and reported transmission rates vary, but evidence suggests that approximately 50 percent of infants born to infected mothers are infected. The most common route of maternal infection is intravenous drug use or sexual contact with an intravenous drug user. (For a detailed discussion of transmission, diagnosis, etiology and medical management issues of HIV infection in children, see Falloon, Eddy, Wiener and Pizzo, 1989)

Third, the explosion in numbers of drug exposed babies and drug using parents is threatening to overwhelm already overtaxed foster care systems. Newborns who test positive for drug exposure are often removed, from the mother's custody before they even go home, but drug use is also destroying families who had been making it together, struggling against the odds, families on the margin for whom involvement in the drug use lifestyle is the last straw. Infants and very young children are entering foster care at a disproportionately high rate. Children under three years old constituted 53 percent of children in placement in San Francisco county in 1986. Data from Alameda County in 1988 indicated that new intakes for children through age 12 included 48 percent in the 0-3 age range. More importantly, the number of medically fragile infants entering foster care is creating a new set of demands upon foster families and social workers. Many of these infants are remaining in hospitals for lack of homes deemed adequate to meet their extensive medical needs.

Finally, drug-exposed babies are being born in times that are difficult for mental health and social services programs. Federal or state fiscal policies have resulted in budget limitations for state agencies, for drug treatment programs, and for programs designed to support families or promote healthy parent-child relationshhips. Programs and staff have been caught between fiscally driven cutbacks and need-based demands for more services. They have also been challenged by the need for new program models to treat infant-parent dyads or families who are feeling the

Practitioners who work with drug-exposed infants and their families face issues that are as intellectually, emotionally and ethically difficult as any that have confronted our field and our society. This article

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This publication was made possible in part by grants from the Commonwealth Foundation, Johnson and Johnson Baby Products Company, and the New-Land Foundation

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represents an effort to help practitioners evaluate research information and to think about clinical and treatment issues.

Direct and indirect effects of maternal drug use on the infant

A review paper (Jones & Lopez, 1988) prepared for the National Institute of Health's Expert Panel on Prenatal Care points out that direct and indirect effects of maternal drug use on the fetus and infant must be understood and addressed simultaneously. One must consider the effects of drugs on the fetus consequent to transfer of the drug through the placenta (e.g., fetal infarcts attributable to cocaine.) One must consider the effects attributable to changes in the fetal environment (e.g., the THC in marijuana retards placental development, which reduces blood flow to the fetus). One must consider the effects of abused drugs on the *mother's* central nervous system which place the fetus at risk.

Investigators must reconceptualize the effects of drug exposure on the developing fetus and infant. Direct and indirect effects of maternal drug use must be understood and addressed simultaneously.

Summaries of the direct and indirect fetal risks of maternal drug abuse for eight classes of the most commonly abused psychoactive drugs produced a lengthy list with many effects common to several of the classes of drugs. Because many studies demonstrating or suggesting a relationship between specific drugs and specific fetal risks have research design flaws, inferring causal relationships between specific drugs and specific fetal risks is uncertain business. The question of specific drug effects aside, the research does indicate that it is in behavioral and neurobehavioral domains, rather than growth parameters, that effects of prenatal drug exposure are most consistently documented if adequate developmental assessments are made.

Jones and Lopez' review of the research suggests that investigators must reconceptualize the effects of drug exposure on the developing fetus and infant. For example, infants exposed to drugs in utero are frequently referred to as "addicted infants." This may or may not be the case. Some drugs are addictive. Some are toxic. Some are teratogenic. Both addictive and toxic drugs can cause the newborn to be sick, small for gestational age, low birthweight, and/or premature. The addictive model assumes that the neonate will undergo withdrawal, after which the infant will grow and develop more or less as if addiction had not been part of his or her short life experience. The toxic model assumes that direct injury to the infant may have occurred.

Teratogenicity is more complex. Unless there are identifiable anomalies at birth, the infant can appear to be free of symptoms. On the other hand, the infant may look like a sick, inconsolable baby undergoing drug withdrawal. These symptoms, however, may actually be the result of the effects of drugs on the developing endocrine or central nervous system. (These behavioral and developmental teratogenic effects of drugs are of particular concern to child development and human services practitioners; if thresholds of pain in the infant are modified, or if the capacity for state regulation, attention, interpersonal relationships and human bonds are compromised, the future of that child is at risk). Teratogenic effects can also reside in the genito-urinary and/or cardiovascular system. These effects are

Editors' note

Practitioners who work with drug-exposed infants and their families face issues that are as intellectually, emotionally and technically difficult as any that have confronted our field and our society. The articles in this issue of *Zero to Three* reflect the work of clinicians, researchers and policymakers who are trying to understand this heterogeneous population of children and families and to address their complex needs.

The reader will notice an inevitable tension between authors' attempts to make useful generalizations concerning drug-exposed babies and their families and cautions about stereotyping. Contributors also differ about the most promising service approaches—although all agree that treating substance-abusing parents simply as criminals is a grave disservice to them and their young children. Missing from this issue entirely is a discussion of drug-using parents whose affluence allows them to avoid detection through hospital urine assays and other means, and whose infants' developmental difficulties are unlikely to be attributed to drug exposure.

Clearly, our field and our society have much to learn about supporting the optimal development of drug-exposed infants and their families. As in any work with children and parents, we need to be guided by careful, empathic attention to the unique experience of each infant and parent. This quality of thoughtful attention is, we believe, the hallmark of the articles in this issue.

The editors wish to thank Donna R. Weston and Barbara Ivins for their invaluable contributions to this issue of *Zero to Three*. Dr. Weston and Dr. Ivins organized the December, 1988 NCCIP Fellows' symposium that inspired this special issue; they also identified clinical and research approaches to be reported and coordinated the bi-coastal collaboration that produced the lead article.

The editors welcome letters from readers that reflect their own experiences in research, practice and policy development relating to drug-exposed infants and their families. To the extent possible these will be published in future issues of *Zero to Three*.

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influenced by time and dosage of exposure, the systems which are under development at the time of exposure, and genetic vulnerability of individuals. Those drugs that act on metabolic, endocrine and central nervous system functions may not cause the appearance of symptoms until specific developmental stages occur in childhood or adolescence.

The infant is not only at direct risk from the effects of the drug(s) used by his mother in pregnancy but also at indirect risk from the mother's behavior. The *Diagnostic Statistical Manual of Mental Disorders, Third Edition—Revised* (DSM-III-R 1987) defines and examines behaviors caused by each class of psychoactive substance. The types of maternal behaviors associated with drug-induced organic mental disorders (psychological or behavioral abnormalities associated with brain dysfunction and caused by psychoactive substances) can place infants at grave risk. Jones and Lopez (1988) report maternal seizures following large drug doses, sometimes resulting in death; paranoid and suicidal ideation; violent or aggressive behavior, particularly with stimulants such as cocaine or with PCP; the commission of harm to self or others while reacting to delusions; accidents caused by impaired motor coordination; and death from respiratory depression following high doses.

Reading the research

A rapidly growing research literature strongly suggests that drug use during pregnancy is linked to a multitude of problems in pregnancy outcome, infant status, and individual development. As is often the case in a new area of research, reports may conflict in their findings regarding the impact of drug exposure on the fetus, neonate and developing child. Clinicians who provide care for drug-exposed infants and their families would do well to keep in mind three important considerations as they read interpretations of data from experiments, whether these are well controlled laboratory trials or unfortunate natural experiments such as the "crack" experience. These considerations are: 1) limits on the usefulness of animal studies; 2) the validity of self-reported drug use; and 3) failure to take account of many interacting variables affecting this population.

Animal studies can elucidate the mechanisms by which drug exposure damages the fetus (teratogenicity) in humans and can possibly provide early information about the effects of a previously unidentified teratogen. But because of species, strain, and individual differences, generalizing results of animal studies to humans can also involve important errors, false positives and false negatives. Thalidomide testing, for example, showed only occasional teratogenicity among 10 strains of rats, 15 strains of mice, 11 breeds of rabbits, two breeds of dogs, three strains of hamsters, and eight species of primates (Lewis, 1987).

Reliance on self-report to determine drug use can lead to spurious findings. Results of a recent study (Zuckerman, et.al., 1989) indicated that women who had positive urine assays for marijuana and cocaine had infants with impaired fetal growth. Among these women, 16 percent of the marijuana users and 24 percent of the cocaine users denied the use of these drugs and were identified solely on the basis of a urine assay. Had the investigators relied only on self-reported drug use, they would have found no significant differences between the supposedly "drug-using" and "non-drug-using" groups.

The interaction of drug use, health and mental health status, sociological, and ecological variables is seldom examined in perinatal research, but the reality is that the consequences of drug exposure are intensified by an array of maternal health behaviors which tend to be associated with the lifestyle of drug abuse. For example, although drug users tend to have a "drug of choice", they also tend to take the substances they can get, and to mix alcohol, cigarettes, and illicit drugs, rather than rely on any one class or type of drug exclusively. Thus, studies of the effects of cocaine exposure, or studies of heroin exposure most likely are, in reality, studies of polydrug exposure.

The effects of drug exposure on the infant can also be compounded by postnatal factors. For example, drug-exposed infants who experience adequate parenting in an adequate environment may have better developmental status than drug-exposed infants whose experience postnatally is comprised of neglect and other stresses.

Clinical and treatment issues

Lack of *any* treatment is the foremost issue for drug-using or drug-addicted pregnant women. Most such women are receiving neither prenatal care nor drug treatment services. Women who seek help during pregnancy cannot get it, according to the 1989 Select Committee survey; two-thirds of the hospitals queried reported that they had no place to refer substance-abusing pregnant women for treatment.

In their 1980 effort to survey programs concerned with the provision of services to drug-abusing women, Beschner and Thompson identified only 25 programs nationwide serving 547 women. Roughly half were providing psychological and family counseling, and a third provided skills assessment and education counseling. Few programs were making an attempt to serve the children of drug-abusing women. The disparity between services offered and services required was highlighted by Beschner and Thompson's findings that women entering treatment programs are likely to present chronic medical and complicated psychosocial problems demanding special attention, and that the higher levels of personal distress and lower levels of self-esteem found in drug-using women, as compared to male drug abusers, indicate the need for special counseling and support services seldom found in existing drug programs. Eight years later, although some pioneering treatment efforts exist, Jones and Lopez (1988) report that "no preventive intervention programs have been located which are targeted specifically on [drug abusing] women and prenatal care."

The challenge for the field is to design programs that can be preventive in focus and comprehensive in design, involving prenatal care, drug treatment, and infant-parent support.

Practitioners and program planners currently face two formidable tasks: 1) applying whatever treatments are currently available while 2) simultaneously

assimilating the growing clinical and research data in order to develop more apppropriate new models for service programs and treatment approaches. Clinical issues and treatment considerations that must be addressed in this process include: 1) the danger of stereotyping; 2) focusing the treatment effort; 3) the impact of the work upon helping professionals; and 4) the development of a conceptual framework that assists clinical and research efforts.

The danger of stereotyping

Available information about the impact of specific and polydrug use on physiology, behavior, and development tends to cite commonalities in the characteristics of drug-using mothers and their babies. Mothers are likely to be described as having a history of poor prenatal care, dysfunctional relationships, chaotic lifestyles and poor parenting. Drug-exposed infants tend to be described in terms of irritability, hyper- or hypotonicity, depressed growth parameters, compromised state regulation and possible developmental delays. Emphasizing only commonalities, however, suggests that a homogeneous group of drug-using mothers and drug-exposed babies exists. In fact, the opposite is the case. Drug use includes many patterns that range from occasional casual use of low doses to episodic intake at high doses or the compulsive use associated with drug dependency. The differences between use and addiction and the causes underlying them have different implications for parenting capacity. Moreover, not all babies exposed to drugs in utero will be affected, nor will those who are affected be affected in the same way. Stereotypes can blind us to the unique characteristics that both infants and mothers bring to their relationships despite the impact of drugs. Treatment efforts must recognize, respect and support individual differences while addressing the very real risks that these mothers and infants face.

Focusing the treatment effort

Whether she is treating a single drug-involved dyad in a mixed practice or is working in an environment where drug use is the norm, the clinician must make a series of decisions about the type and focus of treatment. The complexity of drug use virtually guarantees that these decisions will have to be made in the absence of sufficient information.

First come decisions about whom and what to treat. Whatever their specific drug exposure experience, drug-exposed infants are likely to have health problems (low birthweight, complications of prematurity) and to be more difficult and demanding, and less responsive and rewarding, than even "difficult" healthy babies. Drug-exposed babies tend to be compromised in their capacities for state regulation, participation in the subtle give-and-take of interaction, and communication about their states and needs through smiles, frowns, cries and eye contact. These biologically vulnerable infants are born to mothers who face health and emotional

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problems of their own and who are also compromised in their relational capacities and ability to understand and respond to their infants' needs. Thus these infants experience a double jeopardy: biologic vulnerability due to drug exposure that is exacerbated by inadequate caretaking (Parker, Greer, and Zuckerman, 1988). The multiple needs of infants and mothers produce a strong impetus to treat mother and baby separately. However, the true clinical challenge is to provide interventions to support the mother and protect the infant, while additionally promoting positive mother-infant interaction and the formation of a positive relationship.

Treatment strategies are further complicated by the cumulative occurrence and complex interaction of mothers' health behaviors and psychosocial factors. Depressed mothers and those with "dual diagnosis" require special attention. True addiction calls for even more intense and comprehensive intervention.

Observations from a recent study (Zuckerman, et al., 1989) suggest that depressive symptoms in women and associated health behaviors may be an important link between the social environment and infant outcome. Not surprisingly, the study found that depressive symptoms were more likely to occur among women with a low level of social support and a high number of life stresses. Women with more depressive symptoms were found to be more likely to smoke cigarettes, drink alcohol, and use cocaine--possibly as a form of self-medication, a way of coping with unhappiness and stress. These women also had poor weight gain during pregnancy. Such poor health behaviors in combination are likely to lead to poor outcomes for newborns, and, of course, sick, difficult babies may further stress parents and increase depressive symptoms, which have adverse effects on the developing child.

Efforts to interrupt such a process must consider a woman's emotional and mental health, economic circumstances, and social context. Well-intentioned but unrealistic interventions may simply set women up to fail. If a potentially harmful health behavior serves as a means of coping with depressive symptoms or life stresses or is, as in poor weight gain, itself a symptom of depression, providing information about the risks of poor health behaviors during pregnancy is unlikely by itself to improve women's health and pregnancy outcomes. Interventions that identify women's existing coping strategies, help develop more healthful ones, and focus on reducing stress and depression in the context of a therapeutic relationship may help women master feelings of helplessness and change their behavior. Efforts to reduce alcohol consumption among heavy drinkers during pregnancy that have used this kind of counseling approach have demonstrated beneficial effects to the newborn. An intervention characterized by emotional support and behavioral strategies to help pregnant women reduce cigarette smoking resulted in an increase in birthweight among their newborns (Zuckerman et al, 1989).

The "dual diagnosis" woman has both a drug problem and a psychiatric problem. A pregnant woman who is schizophrenic and is addicted to cocaine, for example, may find that her psychiatric condition is an obstacle to her effective participation in drug treatment. Although she will have difficulty communicating with and relating to others, staff in most drug treatment programs may not be able to identify her difficulties as signs and symptoms of schizophrenia; her mental illness will go untreated, and her drug treatment may also be ill-fated. Women with borderline personalities frequently have difficulties with drugs as well. The Detoxification Program at the District of Columbia General Hospital estimates that 25 percent of patients treated have dual diagnoses.

When drug use is in fact *addiction*, intense and comprehensive intervention is needed. Jessup and others (cited in Jessup, 1983) suggest that pregnancy and motherhood are psychologically loaded issues for chemically addicted women, many of whom feel that motherhood is the only socially acceptable role remaining to them and the only avenue open to achieving feelings of self-worth (Finnegan, 1979; Rosenbaum, 1981). The most difficult psychological task during pregnancy for chemically addicted women, who tend as a group to have poor self-esteem, is the management of guilt and regret about drinking or drug use. If a woman's child is born ill or in withdrawal and the mother attributes the abnormality to her drug use, her guilt may be very great indeed, but it may not be expressed directly. In addition, actions including failure to form an affective bond with the infant, neglect, abuse, and abandonment may each be products of unconscious processes (Fraiberg, 1975). Practitioners must be well trained and caring individuals who can support mother-infant interaction and promote the mother's capacity to become the protector of her infant. Intervention must acknowledge the simultaneous needs for drug treatment and good infant care. It must recognize individual dynamics that may impair the mother-infant relationship (Fraiberg). It must address barriers to formation of a working alliance. (Seligman and Pawl, 1985).

Impact on helping professionals

The increased concentration of drug-exposed infants in neonatal nurseries, early intervention programs and foster homes has created new problems for helping professionals. The prevalence of drug-exposed babies has changed the very nature of many human services jobs, with interventions that were once limited to infrequent, high risk situations becoming the norm. The already difficult care of medically fragile, ill, or developmentally delayed infants who may start life with extended hospital stays is further complicated by issues of parenting ability, resources in the home, and basic safety. Follow-up is ofen difficult. Protective service referrals and out-of-home placements (often involving frequent moves and a series of primary caregivers for the infant) become routine interventions. Social workers, NICU staff, discharge planners, and early intervention specialists cope with heavy caseloads, spend a disproportionate amount of time searching for

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and contacting parents, and struggle to establish some sort of working alliance with them. For many practitioners, the change in responsibilities and in their perceived effectiveness of their work bring high stress, decreased job satisfaction and the need for new coping strategies.

Recognition and ongoing discussion of the special difficulties faced by professionals who treat drug-exposed infants and their families are critical to the delivery of quality care. The array of feelings aroused by the work must be acknowledged. Early rescue fantasies can give way to feelings of helplessness and anger. Particularly in work with infants, these feelings are compounded by a sense of urgency related to the awareness that the babies stranded in hospitals or bouncing between foster homes are in developmental periods critical for the development of attachment, affect, self-regulation, and cognition. Professionals may wrestle with their own feelings of attachment to babies who have been entrusted to their care, and find it difficult to maintain feelings of empathy, concern or helpfulness for mothers without becoming judgmental or even, unknowingly, punitive. For professionals accustomed to feeling effective in their work, these feelings can be intolerable. But recognizing them is a critical first step toward forming a working relationship with a family or implementing a treatment plan.

Whatever their emotional state, few professionals have adequate preparation or resources to handle such a large proportion of high risk cases. Service delivery programs must allow for ongoing supervision, consultation, and peer support so that problems, feelings, and particularly troublesome treatment issues can be shared. Caseloads must be monitored by supervisory staff and staff members' concerns about their caseloads respected if feelings of ineffectiveness and burnout are to be prevented. As frontline workers, foster parents also need support. In-service training and staff education on drug effects, drug treatment, infant-parent interaction and high-risk dyads are essential supports for those who are supporting babies and their families.

A conceptual framework to assist clinical and research efforts

"Deficit models" are as dangerous in addressing the needs of drug-exposed infants and their families as they are in thinking about any group of children or adults. A deficit model for drug exposure in utero assumes that the baby has experienced some neurochemical or other fundamental damage to the organism's capacities for self-organizing and self-righting (Washington, 1975). Symptoms of drug exposure such as impaired self regulatory capacities, hypertonicity, and respiratory difficulties are also observed in full-term, otherwise healthy babies who have not been exposed to drugs. Yet any difficulty of the drug-exposed infant is attributed to the single cause of drug exposure, and the complexities of the impact of drugs on parents and children are deemed beyond understanding and preventive interventions, beyond professional help. The deficit model can be used to rationalize giving up on drug-exposed infants and their mothers.

A "risk model," on the other hand, recognizes that fetal exposure to drugs compromises or jeopardizes developmental processes but that organismic and environmental forces can contribute to positive developmental outcomes. Prospective studies of risk have repeatedly indicated that developmental outcomes are the product of both constitutional make-up and environment, and that a dynamic, transactional model is needed (Sameroff and Chandler, 1975; Werner and Smith, 1982).

The challenge for researchers and practitioners becomes one of learning how better to help drug-exposed infants with compromised capacities reach out to the world, and to support their families in creating a world worth reaching for.

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The Development of Young Children of Substance-Abusing Parents: Insights from Seven Years of Intervention and Research

by

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Addiction is a tragedy that affects the personal lives of substance abusers, their ability to be parents, and their children's development. Drugs and alcohol affect the developing fetus; prenatal drug exposure and parental impairment from chronic drug abuse both affect the developing child. Our research on the developmental sequelae of prenatal drug exposure and the effects of being reared in a substance-abusing family is informed by the patterns, questions and methods of normal child development. But our efforts to reach, assist, and understand substance-abusing families and their young children over the past seven years have been anything but ordinary.

Unique issues in working with substance-abusing families

The foundation of informed and illuminating research about the developmental effects of both prenatal exposure to illicit drugs and postnatal impact of living in a family that abuses substances is the provision of clinical services that address the prevalent survival needs of substance-abusing women and their children. Clinical services are necessary not only on ethical grounds, but are the primary means of maintaining subjects in a research study. Substance-abusing parents are unstable, move frequently, lack telephones, fail to keep appointments, and drop out of sight when abusing illicit drugs. Friends and often family collude with the substance-abusing person's flight from representatives of authority structures such as universities, medical and legal systems. We have found, therefore, that it is very important not only to provide clinical services but to provide them through an intervenor who is able to establish an ongoing, stable, nurturing, and non-threatening relationship with the subject.

Substance abuse undermines normal patterns of interaction and alters conventional priorities (Howard, in press). The families we have worked with, who are poor and are chronic polysubstance abusers, have multiple legal, social, and medical problems. They often come from a history of impoverishment, abuse, and intergenerational chemical dependence. One mother, for example, told us how her mother taught her to shoplift and then to sell the stolen goods on the street. This mother was introduced to heroin by her own father. (In fact, a significant number of parents experienced their first exposure to drugs and alcohol through their own parents' encouragement.) Another mother told us that when she was upset as a child her mother would mix her a drink and say, "Drink this; it will make you feel better." A third mother stated that her own father "shot me up with heroin when I threatened to call the cops on him."

Clinical services that address the survival needs of substance-abusing women and their children must form the foundation for research about the developmental effects of prenatal drug exposure and the impact of living in a family that abuses substances.

Parents who are addicted to drugs have a primary commitment to chemicals, not to their children. Disruption and chaos in the household often result in the neglect or disregard of the child's needs. For example, a three-month-old baby in one of our research projects was found underneath a bed by a neighbor. The baby's parents and friends were high and consequently not merely inattentive to the baby's needs but completely unaware of the baby's presence. Another mother explained her inability to keep medical appointments for her child because she was out "chasing the bag"—that is, looking for drugs. Yet another mother explained her pregnancy by stating that "I need this baby to help slow me down, to keep me off the streets".

Chronic drug use can impair and distort a parent's thoughts and perceptions. Chronic use of mind-altering

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History of Our Work with Substance Abusing Families

The UCLA Department of Pediatric's introduction to substance abusing families grew out of the UCLA Suspected Child Abuse and Neglect (SCAN) Team. Newborns exhibiting withdrawal symptoms from prenatal exposure to drugs were required by California law to be reported to the Child Protective Agency as possible child abuse cases. The SCAN Team enlisted our expertise in child development to identify atypical behaviors that might be indicative of drug exposure and withdrawal, and to assess the impact of the parental addiction on family functioning. A protocol was developed to identify severity of dysfunction in both the infant and the family in order that recommendations could be made to the courts about the medical, ecnironmental, and developmental needs of these children.

From this initial participation in SCAN, beginning in 1981 we developed clinical service projects, an interdisciplinary training project, interagency training projects, and a research study of the developmental effects of prenatal exposure to illicit drugs. These projects had a different focus from traditional programs that target substance abuse. Our emphasis was on the processes of development in the children, the effect of the family environment on the children, and the effect of wider social systems on the children's development rather than a medical model focused on the addiction itself.

The clinical services projects included a three year early intervention program, PROTECT, funded by the Department of Education, Handicapped Children's Early Education Program (HCEEP Grant 024AH50027) that subsequently spawned a statewide interdisciplinary and interagency Outreach Training Grant (HCEEP Grant HO24E80008). Since by this time we were familiar with the nature of substance abuse we made the goals of the intervention purposefully basic and realistic: 1) ongoing health care for identified infants and siblings, 2) developmental assessments and appropriate community referrals for the identified infant and siblings, 3) education to the biological parents, foster parents, and extended family about fetal and infant development and the special needs of drug exposed infants, as well as basic information about child nutrition and safety, 4) counseling for crises and management of daily problems for the biological parents, foster parents, and extended family, and 5) coordination and collaboration among all agencies involved with the identified family.

The multiple needs of the substance-abusing families necessitated both interdisciplinary and interagency cooperation. In order to facilitate the goals of intervention, three professionals were assigned to each family: a social worker, pediatrician, and public health nurse. During a 12 month period these professionals worked with an average of 5 agencies per family and contacted families an average of 52 times. This need for interdisciplinary and interagency collaboration alerted us to the need for specific training, for a wide range of professionals, focused on the issues related to substance abuse.

A project for interdisciplinary training in the area of child abuse, including substance abuse, was implemented for students at UCLA in the graduate departments of psychology and education, and professional schools of medicine, dentistry, public health, law, social work, and nursing in order to prepare these new professionals to respond to these issues as they enter their chosen fields (Child Abuse and Neglect Interdisciplinary Training Grant, Department of Health and Human Services 90-CA-1343). At the same time, training for interagency cooperation between case workers in the Department of Children's Services and nurses in the Los Angeles County Health Department (Training, Education, and Management Skills: Meeting the Needs of Infants Prenatally Exposed to Drugs, TEAMS) was made possible through funding from the Department of Health and Human Services (90-CA-1194).

The research findings from the early intervention project provided the preliminary data for a research grant from the National Institute on Drug Abuse (NIDA Grant RO1DA4139) to study developmental patterns in children prenatally exposed to phencyclidine (PCP) as a primary drug of abuse in the mother's substance-abusing history.

drugs can interfere with memory, attention, and perception. Mothers in our studies have had difficulty remembering their own children's birthdates.

Safety is an issue for family members, for professional staff who make home visits, and most of all for the children of substance-abusing families. Drive-by shootings and violence where drugs are used and sold are daily occurrences in their neighborhoods. Further, children are often in danger because their addicted parents do not function as protectors and advocates. Infancy professionals who have been trained to acknowledge and respect that parents have a primary leadership role in their children's lives must learn to understand that the substance-abusing parent is often unable to assume this primary protective role. The first goal of professionals, therefore, is to keep the child visible in the community in order to monitor the child's safety in a dangerous drug culture.

Unique qualities in the clinical and research staff

Because turnover in staffing interferes with the formation of nurturing, non threatening relationships with substance-abusing families, continuity in the clinical and research staff becomes essential to success. Just as several characteristics of the drug culture and substance-abusing families are unique, the demanding nature of the needs and problems in families requires

a staff of clinical and research professionals who themselves possess specific and unique qualities. Dedicated, stable, and focused professionals who have personal maturity and inner strength, who can be realistic and creative in the face of overwhelming social tragedy, and who have a personal humility that motivates them to organize their relationships to subjects and colleagues from a stance of respect, help reduce attrition in both the subject families and the professional team. Some members of our staff have seen the destructive impact of the drug culture upon family members or friends; others have gone to great lengths to become fluent in the language of street, gang, and drug culture in order to better understand families' descriptions of their life experience. The staff are united in common goals and take problem solving in stride. As one community staff member asked, "How would we know we were alive if there were no problems?"

In our projects, staff turnover has been negligible and our research subject attrition rate minimal. In their relationship with stable intervenors, the subjects experience the rudiments of trust sufficiently to sometimes maintain contact with their intervenors when they are in difficulty. When the intervenor-subject relationship does not result in maintained contact, the intervenor's own knowledge of the community and the community's trust of the intervenor enables her to locate the subjects who have gone into hiding.

Unique problems in research on children of substance-abusing families

Locating subjects is only the first step in collecting data at reasonably consistent times. It is often necessary for the intervenor not only to provide transportation, but also methodically to structure the addict's activities in order to get the subject to the laboratory for assessment. The intervenors in our study not only arrange to accompany and transport the subjects to the laboratory, they often must arrive at the subject's home up to 90 minutes before departure in order to wake mothers, and organize their own preparations and their child's dressing and feeding. In their cars, our intervenors keep diapers, formula, children's clothing, women's clothing, combs, shoes, and personal toiletries to use as needed to ensure arrival at the lab at the appointment time.

These extraordinary efforts are not limited however, to laboratory visits. Observations in the home are equally vulnerable to failure. Subjects who are addicted forget, aren't awake and ready, and leave. If they have failed to tell their network of other drug abusers and sellers about the appointment, they are preoccupied with activities of the addiction, and observation is impossible. When home observations are made for research purposes, the intervenors must also act to ensure the subject's readiness. In substance-abusing families advance preparation is necessary for the collection of data and is critical to the safety of the research staff. It is essential that drug dealers and abusers not be surprised or interrupted by people outside of the drug culture.

The accomplishment of both home and laboratory assessments is governed by a knowledge of families' daily lives. Our subjects are both drug-abusing and poor. Assessments cannot be done on the first or fifteenth of the month when AFDC or welfare checks are received. Cashing and protecting the check from theft (and often from other family members) and spending the money are the priority on these days. Assessments are also not scheduled on Fridays and Mondays because of the anticipation of, preparation for, and recovery from weekend activities. The window of time for home observations is late morning to early afternoon. It is too dangerous for the research staff in the late afternoon and evening because of darkness and increased gang activity after school dismissal.

When home observations are made for research purposes, advance preparation is critical to the safety of staff. It is essential that drug dealers and abusers not be surprised or interrupted by people outside of the drug culture.

Members of the clinical and research staff do not take unnecessary risks in the community by carrying purses, wearing jewelry that looks valuable, dressing in a manner that would be construed as sexually provocative, stopping at service stations, or using public telephones. At the same time they are careful to greet each person encountered in order to diffuse antagonism to those considered to be outsiders because they do not reside in that immediate neighborhood. Even with these precautions, some neighborhoods are still too dangerous for any outside person to enter. In our current research project we have had to drop six families who wanted to remain in the study because incidents associated with drug activity, including guns, shootings, mental disorders, and known gang membership put our staff in personal danger. These difficulties notwithstanding, the knowledge gained from home observations, exposure to the drug culture, conditions of inner city living, and an awareness of the character of daily life events experienced by the children and their families is essential to generating meaningful research hypotheses about developmental process in this population, and to understandable interpretation of the complex findings.

Even when appointments are kept, the quality of disorganization found in the subjects' daily lives is also evident in the laboratory. Research assistants generally need to focus on organizing the mother as much as or more than organizing the child. It is not uncommon for substance-abusing mothers to have difficulty remembering simple instructions or to exhibit difficulties with attention and perception. For example, in a structured laboratory teaching task that required the parent to teach her child how to do a puzzle designed

for three-year-olds, the parent struggled without success to orient a triangle so that it would fit into its appropriate spot. The mother then turned to the experimenter and said, "You need to get a file to fix this piece so it will go in." Parents often seek the researchers' attention for themselves or fail to attend, soothe or help their children feel comfortable in the assessment situations. Some mothers who have recently taken drugs fall asleep during the laboratory assessments.

Current findings from our ongoing research

Our current research is designed to extend our understanding of the developmental sequelae of prenatal drug exposure and the effects of being reared in a substance-abusing family. We wanted to discover where normal processes of development had been altered and which developmental processes seemed resilient to the impact of a dysfunctional prenatal and postnatal enviroment. In determining issues for assessment we were guided by two principles.

- First, the effects of prenatal drug exposure would be found in a continuum that ranges from mortality, to anatomical dysmorphology, to more subtle behavioral effects; severity of effect and rate of occurrence in the population would be inversely correlated (1988, September, Prenatal abuse of licit and illicit drugs. Proceedings from the conference of the New York Academy of Sciences). Our observations and knowledge of normal child development taught us that developmental and intelligence tests alone would be inadequate in demonstrating the subtle deficits that would be most common in these children.

Drug-exposed toddlers score within the low average range on structured developmental tests, but they show striking deficits in free play situations that require self organization, self initiation and follow-through.

- Secondly, we recognized that the alternative postnatal rearing environments in which prenatally drug exposed children are placed would mitigate or exacerbate the adverse effects of in utero durg exposure. We understood that haphazard placements by the courts, which resulted in some children being reared in foster homes, some with extended family, and other with their biological mothers, presented a natural experiment for disentangling the effects of prenatal and postnatal environment (Rodning, Beckwith, & Howard, in press).

In our first empirical study we compared 18 prenatally drug exposed 18-month-old toddlers to a sample of high risk preterm toddlers (Beckwith, 1988) who were of earlier age and lighter weight than the drug exposed children, of similar low socio-economic status, ethnicity, and single parent households. We looked at the children's intellectual functioning, quality of play, and security of attachment to the parent or parent figure. High risk preterm children were specifically selected as a comparison group since previous studies have implicated poor prenatal care and difficult perinatal events as the source of negative developmental outcomes from prenatally drug-exposed children (Chasnoff, Schnoll, Burns, & Burns, 1984; Lifschitz, Wilson, Smith, & Desmond, 1985).

The drug-exposed toddlers had significantly lower developmental scores, but were still within the low average range. Because standardized developmental assessments imposed an external structure in which an examiner directed the tasks for the child, the children appeared more competent than we clinically judged them to be. Our clinical observations led us to include within the research assessments an unstructured free play situation that required self organization, self initiation, and follow-through without the assistance of the examiner to guide the task. In that context, the drug-exposed children showed striking deficits. The drug-exposed children had significantly less representational play than the high risk preterm children. Play for the majority of drug-exposed children was characterized by scattering, batting, and picking up and putting down the toys rather than sustained combining of toys, fantasy play, or curious exploration. Representational play events, such as combing hair, stirring a pot, and sitting a doll at a table, were significantly less frequent and less varied in the drug exposed group than the comparison group.

When we looked at the Strange Situation paradigm (Ainsworth, Blehar, Waters, & Wall, 1978), we found a similar pattern of average scores yet very deviant behaviors. The drug-exposed children did not have a significantly higher percentage of insecure attachments than either the preterm sample or that expected in a poverty group. However, the drug-exposed children did not show the strong feelings of pleasure, anger, and distress in relation to novel toys and the caregiver's departure and return that the attachment assessment was designed to elicit. Moreover, the majority of drug-exposed children had insecure attachments characterized by disorganization rather than organized patterns of avoidance or ambivalence. The antecedents of the disorganized classification need to be carefully understood both in the parent-infant interaction and in possible biological factors within the infant.

In comparing securely and insecurely attached children within the drug-exposed group, we found that the insecurely attached children had significantly fewer play events and poorer quality of play than the securely attached children. Even though the securely attached drug-exposed children had more play events than the insecurely attached, both groups were still more sparse and disorganized than the preterm children. Since a link between representational play and language acquisition has been demonstrated in other studies (Bretherton, 1981, Largo and Howard, 1979), we also anticipate problems in language development for the drug-exposed children at later ages.

The data from that initial study, and the preliminary findings from our present research project showed that prenatal drug exposure increased the initial risk evident

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at birth by extending the organic, physiological effects. 1) into emotional development in affect regulation; 2) into social development in the organization of relationships; 3) and into cognitive development in the representational and symbolic aspects of children's play. The rearing environment, through fostering secure attachment, mitigated the impact of prenatal drug exposure on development to some degree, but did not eliminate the effects entirely.

Clinical and research implications

Children of substance-abusing parents are living in unstable, often dangerous environments, cared for inconsistently by parents impaired by chronic drug abuse. Postnatal environmental factors and the possibility of biological impairments pose grave risks to their healthy development. While resiliency and change are always possible for the child and for the adult, resiliency cannot be taken for granted.

Developmental effects of the multiple adversities that children prenatally exposed to drugs and growing up in substance-abusing families experience daily will have an increasing impact on the educational, medical, social welfare, and justice systems in our society. This burden will only increase as the numbers of children in these circumstances increases. Clinicians and researchers now face the challenge of identifying the services that will prevent and remediate this social tragedy. Communities that are only now organizing their systems of law enforcement and drug treatment to deal with addiction in adults must turn their concentrated attention and expertise to these vulnerable children as well.

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Psychological and Behavioral Effects in Children Prenatally Exposed to Alcohol

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Alcohol is now recognized as a teratogenic drug, meaning that prenatal exposure can cause adverse effects to the offspring. Originally, teratogenic drugs were thought of in terms of their ability to induce physical malformations in offspring, but now it is recognized that teratogenic drugs can cause death, malformations, growth deficiency, and functional deficits (Wilson 1977). Differences in the dose, timing and conditions of exposure, as well as differences in individual sensitivity, account for differential outcomes. Hundreds of studies using laboratory animals under controlled conditions have confirmed the teratogenicity of alcohol even though other conditions such as malnutrition, rearing conditions, and use of other drugs often covary with alcoholism in human beings.

Some teratogenic drugs are also recognized as neurobehavioral teratogens in that prenatal exposure can produce functional impairment and abnormal behavior in offspring (Vorhees and Butcher 1982). For drugs that produce neurobehavioral effects, the functional deficits are usually produced at lower levels of exposure than those required to produce physical malformations. Alcohol has been called the most commonly used neurobehavioral teratogen (Hutchings 1989).

The children most severely affected by prenatal exposure to alcohol are those with a diagnosis of fetal alcohol syndrome (FAS). These children are growth deficient, have a cluster of physical malformations including a characteristic face and they have a high risk of being intellectually handicapped. Chronic alcoholic mothers who continue to drink during pregnancy are at increased risk for having children with FAS. A recent 10 year followup study of the first children given this diagnosis (see article beginning on page 13) indicates that the intellectual deficits and the academic and behavioral handicaps continue into adolescence. Fetal alcohol syndrome has been termed the most frequent teratogenic cause of mental retardation in the Western World (Clarren and Smith 1978).

The present paper will first summarize the animal literature on alcohol as a neurobehavioral teratogen (a prenatal inducer of defects) and then will discuss the empirical and clinical findings with respect to the psychological and behavioral effects in children prenatally exposed to alcohol.

Neurobehavioral effects of teratogenic (malformation inducing) drugs are difficult to establish in humans because behavior has so many determinants and often is difficult to measure. However, carefully controlled studies on laboratory animals have shown that prenatal alcohol exposure can produce a variety of neurobehavioral effects including hyperactivity, decreased learning ability, poor locomotion, incoordination, developmental delays, sucking and feeding difficulties, and response inhibition (Abel et al. 1983; Streissguth and Martin 1983; Streissguth 1983). Animal studies are important for understanding the behavioral and psychological consequences of prenatal alcohol exposure in humans and for identifying the underlying central nervous system defects. Alcohol effects on the brain have been shown in studies of hippocampal changes (West et al. 1984), decreased cerebellar weight (Borges and Lewis 1982), decreased total brain weight (Diaz and Samson 1980), and functional development of the auditory pathway in the brainstem (Pettigrew and Hutchinson 1984). The findings of Taylor and colleagues (1984) suggest that regulation of hormone systems may also be impaired by prenatal alcohol exposure and that some of the aberrant behavioral effects associated with alcohol may be hormonally mediated.

General conclusions from the animal research on prenatal alcohol effects include the following: (1) There is a dose-response relationship between the magnitude of the dose and the severity of the effect (Boggan and Randall 1980); (2) behavioral effects are observed at levels of exposure too low to produce malformations and growth deficiency (Boggan and Randall 1980, Abel et al. 1984); (3) the timing of the exposure is an important factor in the effects produced (Subik 1984); and (4) large individual differences exist in vulnerability to damage from a given dose of alcohol (Chernoff 1977, Swanberg and Crumpacker 1977).

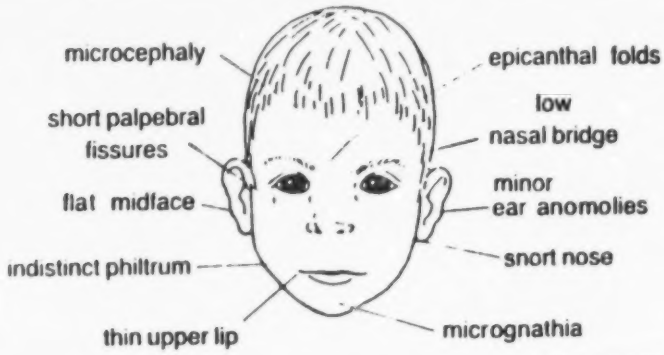
The remainder of this paper will discuss three types of alcohol-related effects on the behavior and performance of prenatally exposed children:

- Behavioral problems of children with the fetal alcohol syndrome,
- Behavioral problems of children of alcoholic mothers, irrespective of the diagnosis FAS, and
- Behavioral deviations in children of moderate to heavy drinking mothers.

Behavioral and Developmental Problems of Children with Fetal Alcohol Syndrome

Children receiving a diagnosis of fetal

Figure 1. Common facial characteristics seen in children having the fetal alcohol syndrome. The characteristics on the left side are those most frequently seen in the fetal alcohol syndrome. Those on the right side are less specific. Source: Little and Streissguth 1982, "Alcohol, Pregnancy and the Fetal Alcohol Syndrome" Unit in *Alcohol Use and Its Medical Consequences: A Comprehensive Teaching Program for Biomedical Education* Project Cork of Dartmouth Medical School. This slide/teaching library unit is available from Milner Fenwick, Inc., 2125 Greenspring Drive, Timonium, MD 21093).



Courtesy of Streissguth et al

alcohol syndrome have a trilogy of symptoms including: (1) growth deficiency and microcephally, (2) dysmorphic characteristics (minor physical anomalies), and (3) central nervous system (CNS) dysfunction. Their mothers are usually chronic alcoholics who were abusing alcohol during the pregnancy (Clarren and Smith 1978; Clarren 1981; Dehaene 1977; Majewski 1978). Figure 1 depicts the most frequent facial characteristics. Figure 2 shows some children with fetal alcohol syndrome (FAS). Heart defects occur in 30–40 percent of the patients with FAS. The frequency of other congenital malformations is elevated as well (Clarren and Smith 1978).

Prenatal alcohol exposure produces a spectrum of offspring effects, from those that are clinically observable in the individual child (such as FAS) to those requiring statistical studies on groups of children in order to establish the relationship between exposure and effects. Children with a diagnosis of the full fetal alcohol syndrome, usually born to the most chronically alcoholic mothers, fall at the far end of the exposure continuum. Children born to alcoholic mothers can have a range of alcohol related effects, but only the most severely affected are diagnosed "fetal alcohol syndrome." Others are variously called "partial fetal alcohol syndrome," "mild fetal alcohol syndrome," "possible or probably fetal alcohol syndrome," or "fetal alcohol effects" depending on the predilection of the examiner.

Most studies show that there are approximately twice as many children called "mildly affected" as "severely affected." Children with fetal alcohol syndrome are the most severely affected, they are the most growth deficient, and most dysmorphic, and the most likely to be mentally retarded (Streissguth et al. 1978*b*). Children with only some of the characteristics of the fetal alcohol syndrome may have intellectual function within the normal range. However, they can manifest a variety of maladaptive behaviors and more subtle CNS effects, including learning disabilities, speech and language problems, hyperactivity, and attentional problems. Although FAS is well defined, considerable confusion presently exists regarding these "partial" effects and more research is needed in this area.

CNS damage associated with fetal alcohol syndrome is primarily of prenatal onset and is manifest by varying degrees of mental retardation. At birth, infants with FAS are often tremulous, irritable, overreactive to sounds, and have feeding difficulties. The failure to thrive and the weak suck, characteristic of many such infants, have been described in detail by Van Dyke and colleagues (1982). During infancy, hypotonia (a condition of diminished muscle tone) and delayed development are often noted. In the preschool years children with FAS often are hyperactive, inattentive, impulsive, fearless, and demonstrate poor motor function (Streissguth et al. 1978*b*). Neural tube defects (implying injury to the embryo during early CNS formation) have been noted in several cases (Clarren 1981; Friedman 1982). In cases that have gone to autopsy (Jones and Smith 1973; Majewski 1981; Clarren et al. 1978; Peiffer et al. 1979), diminished brain growth has been noted, as well as abnormalities of brain development.

Mental handicaps are probably the most debilitating aspect of fetal alcohol exposure. Although slow development and mental retardation have frequently been described as characteristics of FAS, standardized IQ tests have not always been carried out in clinical studies. In an early report on 20 children with FAS diagnoses of varying degrees of severity (Streissguth et al. 1978*b*), the average IQ was 65; however, wide differences of intellectual function were manifest, with IQ's ranging from 15 to 105 (see figure 3). Thus, it would not be advisable to make a firm prediction of mental retardation just because an infant had a diagnosis of FAS. In the aforementioned study, severity of growth deficiency and dysmorphology were significantly related to IQ, with the most severely affected patients generally having the lowest IQ scores. The average IQ of various samples of persons with FAS will depend on the age at testing, the kinds of tests administered, and the manner in which the sample was obtained. While retarded mental development is well recognized as an important feature of FAS, recent work from Berlin (Stemhausen et al. 1982*a*, 1982*b*) has revealed a wide spectrum of disorders that significantly differentiated children with FAS from a control group of normal children, including head and body rocking, stereotyped behaviors, speech and hearing impairment, clumsiness, difficulty with peers, and management problems. This study (one of the few with a matched control group) also confirms the activity, eating, sleeping, and attentional problems that have been described repeatedly in case reports of children with FAS.

The long-term intellectual outcome for patients with FAS has been of some concern to us. We have carried out two small followup studies of children who were reevaluated 1 to 4 years after receiving a diagnosis of fetal alcohol syndrome.

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Figure 2. Children with the fetal alcohol syndrome. All three of these children show several of the common features associated with FAS including the indistinct philtrum, short palprebral fissures, epicanthal folds, and low nasal bridge. Note the differences in various of these features as they relate to racial background. Source: Jones et al. 1973.

Courtesy of Streissguth et al.

(Streissguth et al. 1978*a*, Darby et al. 1981). In the former study, we found that these patients as a group, did not show any remarkable change in IQ over time. However, four individuals showed considerable change in one direction or another (see Figure 4). The small sample size (n = 19) did not permit systematic examination of environmental factors associated with large changes in IQ scores, although decreased hyperactivity with increasing age may have permitted a more valid test of intelligence in some children. Social and emotional improvement were sometimes apparent even in the absence of clear IQ changes particularly when the living situation had improved. Our clinical sample included two young men who had been diagnosed as mentally retarded (unknown etiology) as early as 2 years of age. Later, at 20 and 21 years, when the diagnosis of FAS was made, they had IQs of 57 and 67. Although they are socially engaging, they have mastered only elemental reading and writing skills. We anticipate that both will continue to need sheltered environments.

Iosub et al. (1981) have also reported on the long-term followup of three siblings with FAS. The two elder siblings had IQ's in the mildly retarded range in late adolescence, while the youngest remained moderately retarded. Iosub's finding is in keeping with our clinical impression that successive FAS children of a given mother, will be increasingly affected as long as the mother continues to abuse alcohol. Dehaene and colleagues (1981), in France, have made the same observation.

In another recent report from our lab (Darby et al. 1981), we focused on the prognosis for children with a diagnosis of FAS at birth or within the first few months of life. Out of a sample of eight such infants followed for 1.5 to 6.5 years, only one child (the one with the least severe physical characteristics of FAS) had an IQ within normal limits at followup. Thus, children who are diagnosed with the full syndrome at birth appear to be a group most at risk for poor development. Another short-term outcome study (Golden et al. 1982) examined 12 children with possible fetal alcohol effects diagnosed at birth. Cases were ascertained from medical records noting maternal alcohol abuse and from physical examination of the neonate. Controls were matched on gestational age, sex, and race. (They were not matched for smoking, mother's age, or parity.) At 12 months of age, the infants of alcohol abusing mothers were significantly delayed in physical growth and in mental and motor development in comparison with controls.

Recently, we completed a long term 10-year followup study (see story beginning on page 13) of the first 11 children given a diagnosis of FAS back in 1973 (Streissguth et al. 1985*a*, Jones et al. 1973). Two of the children were dead and one was not located. The remaining eight (of whom six were teenagers) remained growth deficient for height and for head circumference. However, the girls (all of whom had reached menarche at the appropriate age) were no longer growth deficient with respect to weight. This study suggests that the physical manifestations of FAS in the pubescent person may not necessarily include growth deficiency for weight. The adolescent girls in this study were short and overweight, which changes their overall appearance a good deal from the thin, almost emaciated, look they often had when young. We believe that this change in adipose tissue that characterizes some adolescent girls with FAS may be one factor that accounts for

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Figure 3. IQ in 20 children with fetal alcohol syndrome: A clinical sample (n = 20). The figure shows the relationship between IQ scores and the severity of diagnosis. The more severe the diagnosis, the lower the IQ score and the more cognitive deficits are noted. Source: Streissguth et al. 1978*b*.

Severity of Diagnosis	(N)	XIQ	Range of IQ
Mild & Very Mild	(4)	82	60 to 105
Moderate	(6)	68	59 to 81
Moderately Severe	(5)	58	15 to 89
Severe	(5)	55	41 to 69
Summary	(20)	65	15 to 105

*Data from Streissguth, Herman & Smith, 1978

the relatively small number of adolescents who have been identified to date.

Four of these original children with FAS were clearly mentally handicapped on followup, functioning intellectually in the borderline- to severely-regarded range of intelligence (IQ scores of 20 to 57). These children all were living in protected environments and attending special classes for the retarded. They will always need sheltered environments. They manifested poor judgment, were indiscriminately friendly, and had not changed much in IQ scores across time. Figure 5 shows one of these children photographed at four different ages. All of these severely affected children had been in excellent, stable foster or adoptive homes for at least 5 years. Two had never lived with their natural mothers; the other two had a history of neglect and/or child abuse while living with their alcoholic mothers. The degree to which early adverse conditions contributed to their later intellectual handicaps cannot be determined. However, environmental improvements were associated with considerable improvement in their social and emotional behavior though not in their intellectual functioning.

The remaining four original children with fetal alcohol syndrome were functioning intellectually in the borderline- to dull-normal range of intelligence (IQ 80-86) at the 10 year followup. They attended regular classes but received special remedial help and tutoring during the primary school years and had often been kept back a year in school. Schoolwork was increasingly difficult by the time they reached middle school, and school attendance was becoming a problem for the two living in the least supportive environments. All of these four children had learned the mechanics of reading and spelling and were fairly independent in daily life, although at least two appear to be at risk for social and emotional problems.

A continuing question in assessing retarded functioning in children with FAS has been the degree to which the mental impairment derives from prenatal ethanol exposure rather than to the unfavorable environment often provided by the alcoholic mother who continues to drink. While this issue cannot be resolved in all cases, some children with FAS have been raised entirely in excellent foster and adoptive homes and yet have continued to be retarded (Streissguth et al. 1978*b*; Olegard et al. 1979). Furthermore, the degree of mental retardation in older children with FAS seems to be more directly a reflection of the chronicity of the mother's alcoholism during pregnancy than of the caretaking environment. (Streissguth et al. 1985; Steinhausen 1982*a*, 1982*b*; Aronson et al. 1981). Thus, when a diagnosis of fetal alcohol syndrome is made at birth, the prognosis will remain guarded, at least through the early school years, particularly in those children who are the most dysmorphic and the most growth deficient. Close surveillance of the needs of both mother and child should assure that the child has a benign environment in which to develop to

Figure 4. IQ of children with the fetal alcohol syndrome tested on two occasions, 1 to 3 years apart. IQ scores from test #1 are represented on the abscissa, those from test #2 are along the ordinate. Circled points represent changes of one standard deviation or more for the tests given. Source: Streissguth et al. 1978*a*.

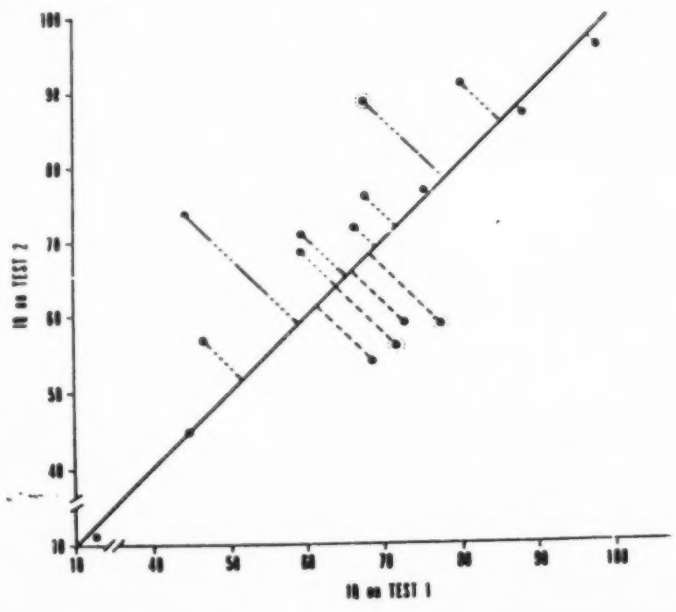

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Figure 5. Child with fetal alcohol syndrome at day 1, 8 months, 4.5 years, and 8 years of age. This child was diagnosed at birth (Jones and Smith 1973) and has spent all his life in one foster home where the quality of care has been very good. He has received various types of remedial help, including corrective lenses and ear tubes, and was placed in special education programs. His IQ has remained stable at 40–45 and he has been hyperactive and hyperdistractable throughout childhood. Source: Streissguth et al. 1984*c*.

Courtesy of Streissguth et al.

the best of his or her abilities.

In our 10-year followup of the eight original children with an FAS diagnosis, we found that three of the eight mothers had died of alcohol-related causes before the children entered school. The three children born to these mothers were among the four most severely handicapped children in the study. Thus, one can see that both the children and their mothers are at risk when FAS is diagnosed in a newborn. On the other hand, the caretaking environments of even the mildly affected children should be carefully monitored, as these may be the children for whom the prognosis is best if appropriate interventions are available.

Infants with FAS and FAE are at risk for failure to thrive and for suffering neglect or abuse when they live in alcoholic environments. Furthermore, their poor sucking ability, medical problems, and hyperactivity all may make them difficult to manage. As they get older, the combination of these children's alert, responsive manner with their deficits in judgment and learning makes it particularly difficult for caretakers to set realistic expectations. Strong support systems are important for such families.

We usually find great improvement in emotional development and social functioning when children with both full and partial FAS have stable and supportive living arrangements (Streissguth et al. 1978*b*; Aronson et al. 1981). Improved behavior, which often occurs even in the absence of changes in IQ, should not be ignored simply because it is more difficult to measure and quantify. The needs of the individual family may range from support and alcoholism treatment for the natural mother to removal of the child from a neglecting or abusing environment. Support in behavioral management and academic planning for the caretakers is almost always needed, whether they be the natural parents, natural relatives, foster parents, adoptive parents, or a single parent raising the child alone. In managing the individual child with FAS, we recommend giving every opportunity for full development of the child's potential.

Behavioral and Developmental Problems in Children of Alcoholic Mothers

Not all children of alcoholic mothers have FAS and not all have developmental or behavioral problems. Very few studies have addressed the question of what proportion of alcoholic mothers have children with FAS. This question is complex because the answer will depend on how severely alcoholic the mothers are and on characteristics that seem to put some mothers at higher risk than others for having an affected child. It is also clear that some children of alcoholic mothers have developmental and behavioral problems apart from the morphological and growth changes associated with FAS. In 1974, two studies of children of alcoholic

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mothers were reported, one from Russia (Shmygin 1974) and one from Seattle (Jones et al. 1974). Shmygin reported on 42 children born to 18 alcoholic mothers in Russia. The 19 offspring born prior to the mothers' alcoholism displayed disorders that were primarily "vegetative, emotional, and behavioral," with symptom onset at 9 to 10 years of age and symptom remission with improved social circumstances. On the other hand, many of the 23 children who were born after the mothers became alcoholic had "profound impairments of the CNS that were manifest early in infancy." Fourteen of these 23 were mentally retarded with concomitant malformations and characteristics of FAS.

The study by Jones and colleagues of offspring of alcoholic mothers utilized data gathered for the Perinatal Collaborative Study of the former National Institute of Neurological Diseases and Blindness. Alcoholic and control mothers were carefully matched on a variety of factors that could be expected to influence outcome. These were socioeconomic status, race, maternal education, age, parity, marital status, and hospital of birth. However, the alcoholic mothers were severely chronic alcoholics, and both groups of mothers were from low socioeconomic levels and were poorly educated. Data were gathered prospectively in a "blind" research design (i.e., examiners and authors had no knowledge of maternal history at the time the data were gathered.) Compared with offspring of 46 control mothers, offspring of 24 alcoholic mothers had a higher rate of infant mortality (17 percent vs. 2 percent), a higher incidence of growth deficiency, and a higher proportion of retrospectively classified FAS (32 percent for this sample vs. 0 percent). Intelligence testing at age 7 indicated that offspring of the chronic alcoholics had significantly lower IQ scores than the control children (81 vs 98). Furthermore, 44 percent of the children of alcoholic mothers had IQ's below 79 compared with only 11 percent of the controls. As IQ scores are also influenced by genetic factors, these child IQ scores should not be generalized to all children of alcoholic mothers, as this was a select group. However, this study points up the added impact of prenatal alcohol exposure upon children who are already at risk. Academic functioning (reading, spelling, and arithmetic scores) were also significantly lower than normal for the children of alcoholic mothers in this study.

A recent update by Aronson and colleagues (1981) of an earlier study (Olegard 1979) presents data from a retrospective study of 99 children born to 30 alcoholic mothers. Compared to expected norms, they found a 5-fold increase in low birth weights, a 10 fold increase in infants called "small" for gestational age at delivery, and twice the number of preterm deliveries. In terms of CNS dysfunction, 35 percent had borderline mental retardation (IQs of 70 to 85); 13 percent had mild to severe mental retardation (IQ below 70); 50 percent had symptoms of brain damage; and 50 percent had psychosocial problems. Early placement and continued residence in single foster homes did not significantly affect intelligence or symptoms of brain damage but did result in reducing the frequency of psychosocial symptoms. A subset of these children of alcoholics compared with a well matched control group had significantly lower IQ scores and perceptual age, impaired motor function, and persistent growth deficiency. Two recent publications from this group summarize their findings on a sample of 103 offspring of these 30 alcoholic mothers. Aronson and colleagues (1985) discuss the perceptual and behavioral outcomes; Kyllerman and colleagues (1985) discuss their growth and motor performance.

Learning disabilities in children with normal IQ have been reported in one clinical study of children of alcoholic mothers (Shaywitz et al. 1980). Delays in onset of speech have also been reported clinically (Shaywitz et al. 1981). In general, the area of language problems in children of alcoholic mothers has not been well studied. It is not clear at this point whether the observed delays are simply related to the childrens' developmental delay and intellectual handicap or to specific language disabilities. Further research is needed in this area.

Majewski and colleagues (1978) in Germany, reporting on children born to a large number of alcoholic mothers, found that the proportion of children with "fetal embryopathy" (the descriptive term preferred by Majewski) was related to the chronicity of the mothers' alcoholism. Thus, in mothers with the most advanced and chronic alcoholism, 43 percent of the offspring had fetal embryopathy. For women whose alcoholism was in the "critical" phase (according to the Jellinek criteria for diagnosis), the rate of fetal embryopathy was 20 percent. An unpublished study from our clinic, on 50 children of recovered alcoholic women who were drinking during pregnancy, suggests that the proportion of children with FAS may be lower than this in some groups of alcoholic mothers. In our Seattle sample, the women were not only recovered alcoholics but were mostly well educated and from middle-class backgrounds. The samples described by Jones, Majewski, and Dehaene were mostly unemployed, poorly educated, and at high risk on many other variables. Factors associated with individual vulnerability to alcohol have not been thoroughly studied.

Thus, it may well be that the prevalence of FAS among alcoholic women depends on a variety of other risk factors that are only now being identified. Such variables may include racial and genetic factors. Certainly, it is clear that the vulnerability of the fetus is one important factor. Cases of fraternal twins (Christoffel and Salafsky 1975; and unpublished cases from our own clinical observations) have shown that twins can be differentially affected.

Some studies have suggested that the prevalence of FAS is relatively higher among certain groups of alcoholic women such as the poor and nonwhites. The extent to which this apparent relationship is influenced by other related factors such as poor nutrition, use of other drugs, or to differences in actual drinking patterns has not been clarified. Larger studies of more diverse groups of alcoholic mothers will be needed to answer these questions. In addition to the risk of FAS and fetal alcohol effects, it should be kept in mind that the alcoholic family environment may jeopardize optimal offspring development in other ways. Several reviews (el-Guebaly and Offord 1979; McKenna and Pickens 1981) of behavioral problems in children of alcoholics conclude, in general, that such children are themselves at risk for alcoholism, accidental deaths, and poor school and job performance. Inevitably, each child's developmental outcome represents an interaction between his or her genetic potential, prenatal exposure, and postnatal experience.

Behavioral and Developmental Problems in Children of Moderate- to Heavy-Drinking Mothers

Women who consume moderate to heavy levels of alcohol during pregnancy have an increased risk of adverse pregnancy outcomes, depending on dose and timing of exposure and on individual sensitivity factors. The related studies are usually large-scale epidemiologic studies in which some of the confounding variables can be statistically adjusted to assess

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subtle effects. Most such studies have examined outcome variables that are easily obtainable from hospital records such as birth weight, birth length, head circumference, gestational age, morbidity, and mortality. Several studies indicate that moderate to heavy drinking during pregnancy increases the risk of decreased birth-size parameters and increases the risk of spontaneous abortions and stillbirths, although not all studies show significant effects on all variables. Reviews of these studies are available elsewhere (Little et al. 1982; Streissguth and Little 1985).

Behavioral outcome studies of moderate prenatal alcohol exposure have been less frequently carried out because it is difficult to use behavioral outcomes with larger groups of infants and children. However, several investigators have studied newborn infants in relation to prenatal alcohol exposure. Ouellette and Rosett found significantly increased malformations, jitteriness, weak sucking, and abnormal sleep patterns (Ouellette et al. 1977; Rosett et al. 1979). Alcohol-related disturbance in sleep wake patterns over the first few months of life have recently been reported in a new sample of children (Landesman-Dwyer et al. 1983).

The Seattle longitudinal study has reported a variety of neonatal effects significantly related to increased alcohol use even when adjusting for other risk factors such as maternal smoking, caffeine use, parity, maternal education, and nutrition which have been summarized elsewhere (Streissguth et al. 1981; Streissguth et al. 1984c). The alcohol-related outcomes have included (1) slow habituation to redundant stimulation assessed with the Brazelton scale (Streissguth et al. 1983); (2) weak sucking and longer latency to first suck, measured with a pressure transducer (Martin et al. 1979); (3) lower Apgar scores, greater need for ventilatory resuscitation and more heart rate abnormalities (Streissguth et al. 1982); and (4) increases in tremors, hand-to-mouth activity, head turns to left, and nonalert wake state, as well as decreases in vigorous bodily activity (Landesman-Dwyer et al. 1978).

Neonatal operant learning was significantly decreased in offspring whose mothers were both heavy drinkers and heavy smokers (Martin et al. 1977). Even at 8 months of age, children of heavier drinkers had small but statistically significant decrements in mental and motor development (Streissguth et al. 1980). They also had continued decrements in height, weight, and head circumference at 8-months (even after adjusting for many other pertinent variables). Together, these behavioral studies suggest that maternal alcohol consumption during pregnancy is related to higher risk of subtle CNS dysfunction in exposed offspring. The presence of some measurable adverse effects even prior to hospital discharge suggests that these CNS effects are of prenatal origin. Furthermore, most of these studies have adjusted statistically for important covariates such as maternal smoking, parity, and education.

Even fewer studies of the long-term behavioral sequelae of moderate prenatal exposure are available. A report from Germany (Mau 1980) has documented no alcohol-related decrement in developmental landmarks, neurological development, or malformations. Alcohol use was primarily defined as "drinks a little every day"; no standardized neurological or psychological tests were used, developmental data were derived from maternal diaries; statistical analysis was by chi-square. It seems unlikely that subtle long-term effects would be observed using such gross measures. Two separate longer-term followup studies of 4-year old children whose mothers were primarily moderate drinkers (Landesman-Dwyer et al. 1978; Streissguth et al. 1984*b*) have shown statistically significant alcohol related decrements in attention assessed in different types of empirical situations after statistically adjusting for a variety of potentially confounding variables. One study (Streissguth et al. 1984*b*) has also shown significant alcohol-related decrements in reaction time. The importance of these subtle attentional variations in 4-year-old children lies in their presumed association with later CNS function and in terms of the implications for later learning and attentional deficits in school. From a later followup evaluation of the same children alcohol related effects on attention and reaction time are still observable at 7 years of age (Streissguth et al. 1985*b*).

In evaluating the effects of prenatal alcohol exposure, one should keep in mind that the assessment of exposure in humans is imprecise and derived by averaging self-reports of women whose individual patterns of consumption vary considerably from woman to woman and from week to week. Thus, any reference to "ounces per day" should be construed as only a rough estimate. In reviewing the behavioral effects of moderate to heavy prenatal alcohol exposure, we have concluded elsewhere (Streissguth et al. 1984*c*) that the effects are generally dose related. The magnitude of the effect and the shape and magnitude of the dose response distribution appear to be a function of the outcome measured and the age of the assessment. Increased risk of clinical abnormality in the individual child at 4 years of age seems to occur at around 2 oz or more of absolute alcohol per day during pregnancy (Streissguth et al. 1984*c*). However, for the more subtle behaviors such as attentional deficits and slow reaction time, where group effects are observed, a monotonic slope is predicted, suggesting that the greater the exposure, the greater the effect. [ ]

This research was originally published in Spanish by the Valgrande Foundation
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Behavior and learning difficulties in children of normal intelligence born to alcoholic mothers

Children referred to the Learning Disorders Unit of the Yale-New Haven Hospital were evaluated for indications of prenatal exposure to ethanol. In a total population of 87 children, 15 were found to have a history of maternal heavy drinking during pregnancy. The 11 boys and four girls ranged in age from 6½ to 18¼ years. Birth weights ranged from 1,580 to 3,150 gm, median weight 2,213 gm. All growth measurements were affected: head circumference 60% < tenth percentile, height 60% < tenth percentile, weight 74% < twenty-fifth percentile. The children had a continuum of dysmorphic features of FAS, with an inverse relationship noted between age of presentation and intensity of dysmorphic features. All had intelligence in the average range (IQ 82 to 113), yet experienced persistent academic failure. In addition, all shared problems of activity and attention regulation. Our results suggest a continuum of teratogenic effects of ethanol on the CNS. Alcohol exposure in utero may be an important, preventable determinant of attention deficit syndromes in childhood.

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A CHARACTERISTIC CLUSTER of features constitutes the symptom complex termed the fetal alcohol syndrome.[1-3] Core components of FAS center on indications of (1) pre- and postnatal growth deficiency, (2) dysmorphogenesis manifest primarily as short palpebral fissures, hypoplastic philtrum, thinned upper vermilion, and midfacial hypoplasia, (3) central nervous system dysfunction presenting as mental deficiency of varying degrees of severity. Of these, mental retardation has been considered to be the most disabling and consistent sequela of prenatal exposure to alcohol,[1] and FAS is now the third most frequent disorder in which retardation is a component.[3] Thus, despite over 200 reports of FAS in the literature, only rarely has a child been described as having normal intelligence, and of the 126 that have received standardized testing, 85% scored below IQ 70. We are aware of only five children with FAS who have achieved a score in the normal range, and only two of these received an IQ above 96.[4-7]

Abbreviations used
FAS: fetal alcohol syndrome
CNS: central nervous system

On the other hand, our own clinical experience in a learning disorders unit, as well as other reports, both human[8] and animal,[9-10] suggest that perhaps more subtle manifestations of CNS dysfunction in the form of behavioral and learning difficulties might be significant but frequently overlooked problems in children exposed to ethanol in utero. To explore this possibility, we examined a group of children referred for school difficulties for indications of prenatal exposure to alcohol. In this report, we describe the growth, morphogenic features, cognitive function, and school performance in such a cohort of learning-disabled children of normal intelligence born to heavy-drinking women. Our findings suggest that children born to alcoholic mothers should be followed carefully through the early school years for the possibility of learning difficulties, and conversely that children experi-

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Supported in part by Grants from the National Institutes of Health NS 12384, AA 03599, the Nutrition Foundation, Clinical Center Grant 1RR-00125), the National Council on Alcoholism Grant and the Mental Health Clinical Research Center No. 1 P50 MH-30929

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Vol. 96, No. 6, pp. 978-982

0022-3476/80/060978+05$00.50/0 © 1980 The C. V. Mosby Co.

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encing school failure should be evaluated for indications of prenatal exposure to ethanol.

METHODS

Selection of sample. All children referred to the Learning Disorders Unit of the Yale New Haven Hospital between September, 1977, and June, 1978, were investigated for historical and clinical evidence of FAS. We were able to identify 15 children from a total population of 87 youngsters whose mothers had a history of alcoholism at the time of pregnancy. Two of the children were evaluated because they were siblings of other patients in our study. The 11 boys and four girls ranged in age from 6½ to 18½ years. Determination of maternal alcoholism during pregnancy was based either on reports by parents or on data obtained from medical or social agency records. The children were born to ten mothers, 60% of whom had died (2) or were currently hospitalized (4) for disorders related to their alcoholism. Of the eight living mothers, five were divorced. Five of the children were sharing a home with their natural mothers, but two of these were presently in the care of surrogates while their mothers were undergoing hospitalization (one for varices, one for detoxification).

All but one of the children were white and lived in private suburban homes. She was our only patient who came from a welfare family and for whom the father's whereabouts was unknown. The remainder of our patients' fathers were all employed. Their occupations ranged from salesmen and self-employed businessmen to middle- and upper-level executives.

Diagnostic evaluation. In each child an extensive history concerning perinatal factors, family history, birth, development, and behavior was initially obtained. An examination was performed by one of us (S. E. S.) assessing growth, morphogenesis, and central nervous system function, and included both a general neurologic evaluation and neuromaturational assessment. Cognitive function was assessed by standardized, age-appropriate individual intelligence tests. In one instance, the Stanford-Binet Form L-M scored with 1972 norms was administered; another child was given the Wechsler Pre-School and Primary Scale of Intelligence. The Wechsler Intelligence Scale for Children was administered to other children ages 6 to 16; children over 16 received the Wechsler Adult Intelligence Scale. Each child's school record, including class placement, need for special services, teacher's observations, and results of any standardized intellectual or achievement testing, was obtained and reviewed. Most children had undergone recent (within the past 12 months) psychometric testing as part of the referral process for special educational services. If more than one test was available for any patient, the most recent score was used. Those patients requiring additional testing were seen at Yale New Haven Hospital by one of us or associates in the departments of pediatrics and psychiatry.

Table. Morphologic and psychologic characteristics in 15 children with the expanded fetal alcohol syndrome

	Number affected
Growth deficiency	
Prenatal (< 2,500 gm)	10
Postnatal	
Height*	
≤ Fifth percentile	7
≤ Twenty-fifth percentile	6
Weight*	
≤ Fifth percentile	4
≤ Twenty-fifth percentile	7
Head circumference†	
≤ Tenth percentile	9
≤ Twenty-fifth percentile	5
Facial stigmata‡	15
Short palpebral fissures§	13
Associated findings‖	
Joint anomalies	7
Hearing loss	5
Renal anomalies	1
Cardiac anomalies	1
Intellectual ability	
IQ 80-85	1
IQ 86-95	5
IQ 96-113	9
$\bar{X}$ = 98.2	

*Based on NCHS Growth Charts, 1976.[11]
†Based on Tanner.[12]
‡ = Two prominent dysmorphic features—short up-turned nose, hypoplastic philtrum, broad nasal root, thinned upper vermilion, relative prognathia in adolescence, epicanthal folds, hypoplastic maxilla
§Based on Clarke.[13]
‖Based on Clarren and Smith.[4]

RESULTS (TABLE)

Growth.

Prenatal. Birth weights of the children ranged from 1,580 to 3,150 gm, with a median weight 2,213 gm and two-thirds of the patients under 2,500 gm. One patient, birth weight 2,014 gm, was estimated to be 34 to 36 weeks' gestation; all other patients were considered term according to parent report or hospital records.

Postnatal. Postnatal growth characteristics of our population are shown in the Table; our cohort had a substantial reduction in body weight, height, and head circumference.[11, 12] Cranial growth was markedly affected, with three children (20%) below the third percentile and another six between the third and tenth percentiles. There

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Figure. Patient with the expanded fetal alcohol syndrome. Note the short palpebral fissures, midfacial hypoplasia, increased distance from the nasal tip to the vermilion border, and relative prognathism.

was one child at, but none above, the fiftieth percentile for age. Height was similarly affected; 7/15 (47%) of our patients were below the fifth percentile for age, and another 40% at or below the twenty fifth percentile. Two patients, both of whom were among the lower-birth weight infants, were now approaching the fiftieth percentile. As with head circumference, there were no children above the fiftieth percentile for age. Weight was least affected, but the distribution was still skewed toward lower weights, with 27% of our patients below the fifth percentile and an additional 47% at or below the twenty-fifth percentile.

Anomalies. The patients had involvement in all major areas known to be associated with FAS and bore an unmistakable likeness (Figure) to others described in the literature. They uniformly demonstrated at least two prominent dysmorphic facial features of FAS; small palpebral fissures[11] were found in 73% of the children. Associated findings included camptodactyly (seven patients) and a mild conductive hearing loss (five patients). Single instances of renal and cardiac defects were also noted. Although other children in the cohort of 87 had some minor anomalies (high-arched palate, low-set ears, single palmar crease) in no case did they demonstrate the constellation of stigmata characteristic of children born to alcoholic mothers.

Central nervous system. With the exception of mild hypotonia in six of the patients, classic neurologic examination was unremarkable. Evaluation for the presence of signs of neuromaturational irregularities ("soft signs") revealed four patients with mixed eye-hand dominance and two with ambidexterity. In older patients (over 11 years) persistence of associated symmetric and asymmetric movements were seen. At all ages, the patients had indications of varying degrees of fine motor dysfunction involving finger-thumb testing. Computed tomography of the brain was performed in five patients and the results were normal.

Intellectual functioning. Intelligence testing indicated a mean full scale IQ of 98.2, with scores ranging between 82 to 113. Thus, the overall range of performance of our patients represents the entire spectrum of average intelligence.[10] There was an equal division among the children who obtained superior scores in either the verbal or performance scales. Similarly, when significant discrepancy (15 points or more) occurred between verbal and performance IQ, each subtest group was equally represented at each extreme. Of particular interest was the subtest profile with highest scores most frequently recorded in similarities, comprehension, object assembly, and block design, which was in contrast to a depressed performance on the coding, arithmetic, digit span, and information subtests. A single child was given the Stanford-Binet and achieved an IQ of 86.

Significant relationships involving age and IQ (Spearman's rho = 0.47 $P < 0.05$), and an inverse relationship (rho = 0.58 $P < 0.025$) between age and morphologic stigmata were noted. A possible interpretation for this finding is simply that the older children in our cohort presented themselves to us at a later age because they were less severely affected. We did not note the positive correlation between height and IQ (rho = 0.29 $P < 0.1$) reported by Streissguth et al.[5]

School functioning. Common to all children was the early experience of school failure. Hyperactivity was described in all but one of the patients' school records. Six had a history of treatment with or were currently receiving stimulant medication. Inability to function without intensive one-to-one or small group instruction, short attention span and distractability were shared by the patient population uniformly. Comments such as "behind ever since he entered school," "an itch," "cannot sit still, easily distracted," "never concentrates unless directly supervised by a teacher," "seems to have the skills yet is not learning" were noted in all of these children's records. The severity of school difficulties was reflected in the early referral for special education services; 13 of our patients received such recommendations by the first grade and all were

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recommended for special services by the third grade. Eleven of the children had been retained for at least one year but were still experiencing school failure and thus were subsequently referred for special educational assistance. Of the 13 children still in school, seven require full-time special class placement, while four are in regular classes with the additional support of learning disability tutors. Two children attend regular class: one child who has been referred for special education services and is awaiting class placement and another child who continues to experience school difficulties in his regular classroom.

DISCUSSION

Although the deleterious effects of maternal alcoholism have been suspected since antiquity, the concept of fetal alcohol syndrome had its origins only within the last decade, beginning with the work of Lemoine et al[1] and coming to the attention of most pediatricians in this country with the work of Ulleland[2] and of Jones and associates.[3] Our report differs from previous contributions by emphasizing that subtle central nervous system impairment in the form of behavioral and learning deficits may occur in children of normal intelligence born to alcoholic mothers.

For the most part, severe CNS dysfunction has been considered as one of the most consistent and disabling components of this syndrome. Thus, Clarren and Smith[4] state, "Although not all persons affected are retarded, rarely has an affected patient displayed average or better than average mental ability." However, Lemoine et al[1] described hyperactivity together with problems in attention and school behavior in children born to heavy-drinking mothers, and Streissguth[10] reported difficulties on tests of achievement, including reading, spelling, and arithmetic, sometimes in the absence of severe morphologic manifestations of fetal alcohol syndrome. Streissguth et al[6] have also described a child with moderately severe fetal alcohol syndrome and normal IQ with both behavior and learning difficulties. Our findings provide further support for the belief that milder degrees of CNS dysfunction are frequently encountered in the offspring of alcoholic women, and suggest consideration of an expansion of the concept of fetal alcohol syndrome to include behavioral and learning deficits as manifestations of CNS involvement. Such a broadened perspective is of practical significance in that appreciation of the full spectrum of CNS disabilities that might reflect ethanol teratogenicity requires examination for subtle findings that may not lend themselves to early recognition or to satisfying quantification. These abnormalities may occur in children of normal intelligence and may be apparent only when the child must utilize higher cognitive processes to meet academic demands in a classroom situation.

In our role as physicians closely associated with a learning disorders unit, we are particularly sensitive to the frequency with which learning difficulties are ascribed to environmentally determined emotional and social factors in the offspring of alcoholic women, with little or no consideration given to the possibility that poor school performance may reflect a learning disability. Our findings suggest that rather than focusing solely on the intractable home situation of children born to alcoholic women, consideration of a referral for evaluation and possible special education placement as a learning disabled child be made.

An increasing body of evidence[7-9] suggests a relationship between parental alcohol abuse and the development of disorders of activity and learning in their offspring as, for example, in the symptom complex currently designated attention deficit disorder[8]; this relationship is not exclusively mediated by social experience. Our data indicate a constellation of mild dysmorphic features of fetal alcohol syndrome, findings of hyperactivity and persistent school learning difficulties in children with normal intelligence born to heavy-drinking mothers. Alcohol exposure in utero may be an important, preventable determinant of attention deficit syndromes in childhood.

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APPENDIX B:
LETTER FROM PRISON: A Cocaine-Addicted Mother

The following letter was written by a mother who was incarcerated for a robbery she committed, while pregnant, to support her cocaine addiction. She wrote the letter as a testimony for Parent-to-Parent of Florida, to be used in hearings with Florida legislators. Today she has three children and has overcome her drug problem.

March 25, 1987

Dear B.T.,

How are you doing? I hope as your eyes fall upon these words you are in the best of health and happiness. I am doing fine. I am so sorry it took me so long to write to you. It might be too late for this letter, but I hope it's not and I hope this is what you wanted.

Well, it started when I realized that I was pregnant. By me smoking cocaine heavily, I didn't realize that I was three months. I thought I was two months. And when I did, the first thought was I didn't want to be pregnant. It was the last thing I wanted. I wanted to smoke and I knew I had no business smoking cocaine while I was pregnant, so I thought of the next thing and that was of having an abortion, but the baby's father didn't want that. He wouldn't pay for it and got upset with me for even thinking about it. I still didn't want to have a baby. I felt like it was going to slow me down or stop me from smoking. I didn't want to stop and so I didn't. I kept right on smoking.

At this time, I wouldn't tell anyone, only the father knew. I wouldn't go to the doctor either. I had just made up in my mind that I was not having any baby. One night I started having pains in my stomach and I thought I was having a miscarriage. I wouldn't say anything about the pains, I was trying to wait until I saw blood until I went to the hospital. Then they couldn't stop me from losing it. But the pains got so I couldn't bear them and it was also making it hard for me to breath so I told the father to call the ambulance for me. Anyway, I went to the hospital and at first they didn't know why I was having pain and was so short of breath. After a little while I threw up and the pain went away and I could breathe again.

While I was waiting for them to tell me why I was having these pains, I had given them a urine sample and they ran tests on it. Shortly after I threw up they came back and told me I was pregnant and the pains were only gas pains so when I threw up, it relieved the pain. I had just eaten something that disagreed with my system, that was all. I said to myself, Hell, I know I am pregnant and you meant to tell me that I am not having a miscarriage. You know, it seems like I was so upset with them.

In the meantime, I was beginning to show so I had to tell sooner or later. I finally made up my mind to go to the doctor and by this time I thought I was about five months. The doctor I went to had delivered my last child and she knew me pretty well. By me smoking all the time I didn't have money to pay the bill. The father had insurance on me from his job, so she took that. When she checked me she kept on asking if I was sure how many months I was. I told her yes, I was sure. So she decided to have one of those things (I don't know how to spell it) where it tells you how many months you are, what you are carrying and how many you are carrying. Just to make sure that I really was how many months I was saying.

It turned out that I was more. I also found out that I was carrying twins. Just as she was about to take the guider off she spotted another head. I told her it was a mistake, check again, it can't be true. I didn't want one baby, let alone two. What am I going to do with twins when I am staying out and smoking cocaine. I just didn't want any babies.

Now I go home and tell the father that I am carrying twins and we decided to tell my mother. She got upset because she knew I was smoking heavy.

After a month or so I started liking the idea that I was going to have twins. I would stop smoking for awhile and then start again after. My doctor aked me if I was using any kind of drugs and I told her that I was only smoking pot, but that was all. She told me I needed to stop smoking it and I lied and said I would, but I didn't stop smoking cocaine or pot.

One day when I went to pick up the father's paycheck, I smoked it all up. I wanted more cocaine, but didn't have any money. So I robbed a store to get more money to smoke some more. I was still pregnant. I was caught at 3:00 that following morning and I stayed in jail until lunchtime on Tuesday. They let me go because I was a high risk of going into early labor, that is why they let me go on my own recognizance.

My doctor had me come in and did a full check up on me and asked me why I was smoking cocaine and said that it could harm my babies. But it just went in one ear and out the other. Well, one Friday morning I started smoking, but not that much. At about 6:00 that Saturday morning I went into labor and went to the hospital. My doctor asked me if I had been smoking and of course I lied again and told her no, I haven't been smoking since I robbed the store. Then she did an x-ray on me and told me she wanted to see which way the babies were lying and whether or not they were in a downward position. They were. Then I got scared and happy too because now I really did want the babies. I had the first baby and heard it cry and all of a sudden it didn't make any more noise and the doctor goes to do all kind of things to it. I ask what is the matter with it and am also trying to push the other twin out. He won't come so I have to have a C-section and they are still trying to work with my first baby. I am waiting to have the C-section and the other baby's heart stops beating. Everything seems to be going wrong now. I just don't know how to take it or accept it. So finally I have the C-section and the other baby came and he had no heart beat when he came.

When I finally came to, they told me that my babies were having a lot of problems and I started thinking about all the cocaine I had been smoking throughout my whole pregnancy. To me, I knew that is why my babies were having problems and suffering like they were.

They were both rushed to Shands Hospital and put on breathing machines. They couldn't breathe for themselves and the doctor didn't think they were going to make it. I just knew that if I hadn't been smoking while I was pregnant, they would have been alright. I hated myself for that because of my stupid, dumb self mess up my babies lives. So one of my babies got to where he could breathe by himself. That was the first one T., and they took him off the machine. The second one, G., never did make it off the machine. They called for me to come to Shands and I did. They told me that G. was dead and that the machine was doing all his breathing for him and that he was in a deep coma and was not coming out of it. They wanted to unplug his machine. I said no at first. I wanted to avoid the issue, the thought of unplugging G's machine. I told the doctor to wait and maybe he would come out of it, and to please give him some more time. He said that there was no use, the baby was dead. It was so hard to hear that. So me and the father went back the next day. I watched him unplug the machine and watched my baby die.

I felt like I pulled the plug. I killed my baby smoking cocaine. I was so angry, but not angry enough to stop smoking cocaine.

T. was doing fine. He had a set-back, but he was doing good. I tried so hard to make him at least make it as I lost G. I went home that day and just said, Why, God, why? Why didn't he just take me instead of him?

T. was getting better, so they transferred him to Tallahassee at T.R.M. Hospital. I went and stayed a weekend there so I could learn how to take care of his special needs. I was trying and so determined to make him survive. There were certain things that the doctors said he wouldn't be able to do. And some of the things they said he would not be doing he did them. I was so happy when he did some of them. But I was still smoking and hadn't learned my lesson yet. The pediatrician that was seeing him was very happy with his progress. He was gaining weight and everything. I was so proud of myself for doing so well with him. I took T. to the doctor and he had gained some more weight and he had a light cold. But it was not unusual that he have a light cold because he will always keep one because of his problems. Other than that he was doing just fine.

That was on Friday, March 21. On Saturday morning, March 22, I was wakened up by my other older son at about 7:30 to feed him. I went to fix T's formula to feed him and he was still asleep, or so I thought. I couldn't wake him up, so I tried to listen for a heartbeat and couldn't hear one. I rushed him to the hospital and I waited and waited. After about 20 or 30 minutes the doctor came out and told me my baby was dead. They couldn't revive him. I was in shock. I felt like somebody had just slapped me in the face. I cried out and said, No, not again! Not T, God - You took one, wasn't he enough?!

I had to tell the father and he felt like it was my fault that he died and so did I. I just couldn't understand what went wrong. I had just taken him to the doctor Friday evening and this was Saturday morning. What the hell happened between then and now, please tell me. He was doing so good. At least I thought so, and so did the doctor. All I knew was that the doctor had told me that T. was dead and I just wanted to be by myself. I didn't want anybody around me or anything. Some how or another I felt like it was a nightmare and when I woke up it would be over with, but it wasn't.

I was due to go to court that following Monday, but the State Attorney delayed it. They said they were sorry and they would wait until after T's funeral. I wanted them to take me to court then. I just wanted to go get away from home, get away from home and everything and everybody.

The day came when I had to put T .away. I went to the graveyard and the funeral director asked if we wanted to see him one last time. I didn't want to look, I just wanted to remember him as he was. But then, there was a part of me that did want to see him. I didn't though. As I watched them put him in the ground and cover him with dirt, I felt like a part of me was being put in the ground and covered up with him. Right then and there I said to myself cocaine would never take anything else from me and that was the last straw.

That was the bottom. I loved and still do love him. I will never forget them. Right now I have accepted the fact that my babies are gone. But I have not accepted the fact of the way they died. I will always feel responsible in a way for my twins' death. Because it took the death of my babies to make me stop smoking cocaine. Not jail or prison, but my babies' death. I am now trying to handle and deal with it. I am trying to better myself for my other children and for me as well. Cocaine almost destroyed me but when I came to prison I got a second chance. I thank God for that. But I have got to accept my feelings about T. and G.. I have not quite recovered yet but I am on the road to recovery.

B.T., I hope this is what you wanted and it helps you. It did me some good to write this because I know I still have problems about T.and G. and I need to deal with them and stop pushing my feelings aside or in the back of my head somewhere. I learned the hard way and I wouldn't want to see anyone go through what I did. I must be going now, but I hope to hear from you soon. Take Care.

Love,

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